Appendix D:
Geotechnical Supporting Information

draft

THIS PAGE INTENTIONALLY LEFT BLANK

GEOTECHNICAL REPORT

731 W. Cutting Boulevard

Richmond, California

November 20, 2020
Project No. 4739



Prepared for
Duke Realty
by
Gularte & Associates, Inc.

Gularte
& ASSOCIATES, INC.
Geotechnical Consultants

1049 NICHOLS DRIVE, ROCKLIN, CA 95765
Phone: **916.626.5577**
FAX: 916.626.5533

TABLE OF CONTENTS

1 INTRODUCTION 3
2 LOCATION, DESCRIPTION, AND PHYSICAL SETTINGS 4
2.1 SITE LOCATION 4
2.2 SITE DESCRIPTION 4
2.3 PHYSICAL SETTINGS 4
2.3.1 Regional Geology 4
2.3.2 Local Geology 5
2.3.3 Faults and Seismicity 5
2.3.4 Geologic Hazards/Liquefaction Potential 5
2.3.5 Groundwater 6
3 FINDINGS AND CONCLUSIONS 7
3.1 SUBSURFACE CONDITIONS 7
3.2 LABORATORY TESTING 7
3.3 EXISTING FILL 9
3.4 EXCAVATION EFFORT 9
3.5 SUITABILITY FOR CONSTRUCTION AND SITE CONCERNS 10
4 EARTHWORK RECOMMENDATIONS 11
4.1 NATIVE AND IMPORT FILL MATERIAL 11
4.2 SOIL IMPROVEMENT – BUILDING PAD OR DEEP FOUNDATIONS 11
4.3 FILL COMPACTION 12
4.4 TRENCH BACKFILL 12
4.5 SLOPES 12
4.6 SITE DRAINAGE 13
5 FOUNDATION RECOMMENDATIONS 14
5.1 CONVENTIONAL FOUNDATIONS – AFTER GROUND IMPROVEMENT 14
5.2 SLAB ON GRADE 15
5.3 RETAINING WALL PARAMETERS 16
5.4 2019 CBC SEISMIC PARAMETERS 17
5.5 PAVEMENT DESIGN 18
5.5.1 Asphalt Concrete Pavement 18

5.5.2 Trash Enclosure Portland Cement Concrete Pavement Design .18
5.6 SPECIAL INSPECTIONS 19
6 LIMITATIONS 20

FIGURES

Figure 1 – Vicinity Map
Figure 2 – Site Plan
Figure 3 – Seismic Hazard Accelerations
Figure 4 – Geologic Map
Figure 5 – Seismic Hazard Zones Map

APPENDICES

Appendix A – Boring Logs & Cone Penetrometer Tests Logs
Appendix B – Laboratory Test Results
Appendix C – Historical Aerial Photographs
Appendix D - Cliq Software Output
Appendix E – Geotechnical Terms/Definitions

1 INTRODUCTION

Duke Realty has retained Gularte & Associates, Inc. to perform a geotechnical report for a proposed industrial warehouse project located at 731 W Cutting Boulevard in Richmond, California (APN: 550-030-007-3). To conduct our geotechnical report, we performed the following services:

- Reviewed the site geology and groundwater conditions.
- Performed 4 exploratory borings to a maximum depth of approximately 52 feet below ground surface (bgs) to classify the soil and obtain samples for laboratory testing.
- Performed 3 exploratory cone penetrometer testing (CPT) soundings to a maximum depth of approximately 50 feet bgs.
- Performed 2 consolidation analysis.
- Performed 2 unconfined compression analyses.
- Performed 1 expansion index analysis on a bulk sample to determine the expansion potential of the native soil.
- Performed 6 sieve analyses on disturbed samples obtained during our exploratory borings.
- Performed 6 moisture-density analyses on tube samples obtained from our exploratory borings.
- Performed engineering analyses and used engineering judgment for earthwork and foundation recommendations in this report.
- Prepared this report with our findings, conclusions, and recommendations.

Civil and structural engineering plans were not available at the time of this report. We recommend that we be retained to review the project grading and structural plans at the 50 to 90 percent stage for compliance with our report. Additionally, we recommend that we be retained to perform soil compaction testing services for the proposed building pad and pavement areas, as well as, utility trench backfill.

2 LOCATION, DESCRIPTION, AND PHYSICAL SETTINGS

2.1 SITE LOCATION

Figure 1 shows the vicinity map of the proposed industrial warehouse project located at 731 W Cutting Blvd in the industrial zone of southwest Richmond. The site is bordered by W Cutting Blvd on the south, Canal Blvd on the west, an industrial warehouse on the east, and a southbound Interstate 580 onramp on the north.

2.2 SITE DESCRIPTION

The approximate 7.9-acre site is shaped as a trapezoid. The north-south axis along the western property line is approximately 284 feet in length and along the eastern property line is approximatley 503 feet in length. The east-west axis along the northern property line is approximately 684 feet in length and along the southern property line is approximatley 667 feet in length. The site is currently occupied by a welding gas manufacturing facility. A project topographical map was not available at the time of our site subsurface exploration. Based on the 2018 USGS 7.5-minute Topographical Map of the San Quentin, California Quadrangle, the average site elevation is approximately 10 feet above mean sea level. Site topography is relatively flat.

Existing industrial buildings are located in the southwest, northwest and southeast-central portions of the site. Large aboveground gas storage tanks are located along the eastern property line, as well as in the northwest portion of the site. The remainder of the site is covered with paved driveways.

Duke Reality proposes a 144,960 SF concrete tilt-up warehouse structure with 28 loading dock doors. Paved parking areas and driveways are proposed along the perimeter of the warehouse structure, with a total of 145 parking spaces and 36 trailer spaces. As part of this construction, approximately 3 feet of additional fill is planned at the project site.

2.3 PHYSICAL SETTINGS

2.3.1 Regional Geology

The site is located in the San Francisco Bay region of the northwest trending Coast Ranges geomorphic province of California. San Francisco Bay fills a late Pliocene structural depression which divides the Coast Ranges province into northern and southern portions. Extensive folding and faulting of the province has created the northwest trending ranges in a mountain building episode that began in the late Pliocene and culminated in the mid-Pliocene. The majority of the Coast Ranges contain sedimentary deposits of both marine and terrestrial origin underlain by either the Franciscan formation (east of the San Andreas Fault) or granitic rocks of the Salinian Block (west of the San Andreas Fault). The site is located between the right-lateral transform San Andreas fault to west and the right-lateral strike-slip Hayward fault to the east.

2.3.2 Local Geology

The 1991 Geologic Map of the San Francisco-San Jose Quadrangle (1:250,000), prepared by the California Division of Mines of Geology, was reviewed prior to our subsurface exploration for the site. This source indicates that the site is composed of artificial fill material underlain with either Quaternary intertidal deposits or Quaternary alluvium. This confers well with the soil observed during our subsurface exploration.

2.3.3 Faults and Seismicity

Based on the 2010 Fault Activity Map of California prepared by the California Geological Survey, the nearest faults within a 50 mile radius from the site that have ruptured historically or those with mapped surface displacements during the Holocene (i.e. younger than 11,700 years before present), are the Hayward Fault (3.1 miles northeast), the Rodgers Creek Fault Zone (12.2 miles north-northeast), the San Andreas Fault (15.0 miles southwest), the Seal Cove Fault (16.6 miles southwest), the Concord Fault (17.4 miles northeast), the West Napa Fault (17.8 miles north-northeast), the Calaveras Fault (19.0 miles southeast), the Green Valley Fault (19.3 miles north-northeast), the Clayton Fault (22.5 miles east), the Cordelia Fault (22.9 miles north-northeast), the Pleasanton Fault (23.3 miles southeast), the Marsh Creek Fault (28.0 miles east-southeast), the Monte Vista Fault (38.3 miles south-southeast), the Las Positas Fault (39.5 southeast), the Crosley Fault (40.3 miles south-southeast), the Greenville Fault (45.4 miles southeast), the San Gregorio Fault Zone (46.6 miles south-southwest), and the Maacama Fault (49.0 miles north-northwest).

According to the 2008 Ground Motion Interpolator prepared by the California Geological Survey, the earthquake peak ground acceleration that has 2 percent probability of being exceeded in 50 years for the property is 0.876g, and the earthquake peak ground acceleration that has 10 percent probability of being exceeded in 50 years for the property is 0.562g. This is a relatively high level of ground shaking for California.

2.3.4 Geologic Hazards/Liquefaction Potential

Risk of landsliding or lateral spreading is not considered likely, as site topography is relatively flat and the subsurface is composed of predominately fine grain soil.

We observed 3 CPT tests to a depth of 50 feet to help evaluate the liquefaction potential at the site. Both the auger sampling and CPT generally classified the native soil as silty clays with only very thin seems of sand or silty sand layers. Based on our analysis of the CPT results using Cliq computer software, liquefaction is not a concern at the project site. For our analyses, we used a peak horizontal acceleration of 0.562g and a high ground water elevation of 10 feet below grade. Seismically induced settlement was estimated at ½-inch. In addition, we evaluated the effect of 3 foot of soil import surcharge on seismic settlement, the soil surcharge (modeled as a 400 psf surcharge) resulting in an additional ½-inch of seismically induced settlement. Thus total seismic induced settlement is approximately 1-inch.

2.3.5 Groundwater

Depth to groundwater was observed in the exploratory borings between approximately 10.5 feet bgs and 12.5 feet bgs. We expect groundwater likely ranges from 7 to 15 feet below ground surface depending on tide and seasonal affects.

3 FINDINGS AND CONCLUSIONS

3.1 SUBSURFACE CONDITIONS

Four exploratory borings (B-1 thru B-4), were drilled within the proposed building footprint to a maximum depth of 52 feet below ground (bgs) surface to record SPT N-Value, classify the soil profile and obtain samples for laboratory testing. Boring locations are shown in the Site Plan, Figure 2, and the boring logs are shown in detail in Appendix A.

The findings in the exploratory borings were fairly consistent across the site. Fill material was observed in all borings to approximatley 2 to 5 feet below existing grade. The deepest fills were observed in the southern portion of the site towards the harbor (See Section 3.3 for fill descriptions). Native soil consisted of soft saturated clay (intertidal deposits) from approximatley 5 to 15 feet below existing grade. In borings B-2 and B-4, saturated well graded sand with silt (alluvial channel deposits) were observed from approximatley 13 and 18 feet bgs. Interlaying of medium stiff silty clay and clayey silt with rare sandy clay was observed to total depth for the remainder of the boring profiles.

3.2 LABORATORY TESTING

Two one-dimensional consolidation analysis was performed on a 2.5-inch diameter stainless tube sample obtained at 10.5 feet bgs in boring B-1 and remolded sample obtained at 15 feet bgs in boring B-1. The results of these analyses are presented in Table 1 below.

Boring/Depth	Axial Load (psf)	Void Ratio	Axial Strain (%)
B-1 (10.5'-11')	Initial	1.113	0.00
	100	1.114	-0.01
	250	1.112	0.08
	1,000	1.026	4.15
	2,000	0.927	8.81
	4,000	0.806	14.56
B-1 (15'-16.5')	Initial	0.767	0.00
	100	0.767	0.00
	250	0.767	-0.02
	500	0.767	-0.02
	1,000	0.759	0.43
	2,000	0.740	1.51
	4,000	0.702	3.69

Table 1 – Consolidation Analysis (ASTM D2435)

Two unconfined compression analyses were performed on 2.5-inch diameter stainless tube samples obtained during the subsurface exploration. The results of those analyses are presented in Table 2.

Boring	Depth (ft)	Unconfined Compressive Strength (psf)
B-2	6' - 6.5'	324
B-3	10.5' - 11'	578
Table 2 – Unconfined Compressive Strength Analysis (ASTM D2166)		

An Expansion Index (EI) test was performed to evaluate the expansion potential of the onsite soil. The Expansion Index test resulted in an EI of 61.4 for soil obtained between 2 and 3 feet bgs of boring B-1. This indicates a moderate expansion potential.

Six sieve wash analyses over the No. 200 sieve were performed to further classify the native soil observed during the subsurface exploration. The results of these tests confirmed our field classifications and are presented in Table 3.

Boring	Depth (feet)	Passing No. 200 Sieve (%)	Water Content (%)
B-1	5' - 6.5'	99.4	58.0
B-4	10.8' - 11.5'	81.1	28.4
B-1	15' - 15.5'	40.1	19.8
B-4	16' - 17.7'	6.2	9.6
B-2	17' - 18.3'	11.9	15.3
B-3	22' - 22.8'	56.0	23.5
Table 3 – Sieve Wash Analyses Over No. 200 Sieve			

Two sieve analyses were performed to further classify the native soil observed during the subsurface exploration. The results of these tests confirmed our field classifications and are presented in Table 4.

Boring	Depth (feet)	Gravel (%)	Coarse Sand (%)	Medium Sand (%)	Fine Sand (%)	Fines (%)
B-4	16' - 17.7'	28.3	23.3	27.9	14.3	6.2
B-2	17' - 18.3'	19.2	36.3	26.7	5.9	11.9
Table 4 – Sieve Analyses						

Moisture-density tests were performed on 2.5-inch diameter stainless steel tube samples obtained during the subsurface exploration. The results of these tests are shown in Table 5.

Boring	Depth (feet)	Water Content (%)	Dry Soil Density (pcf)
B-1	3.5' - 4'	24.5	95.6
B-4	6' - 6.5'	50.8	69.0
B-1	11' - 11.5'	21.8	98.2
B-3	11' - 11.5'	20.5	98.2
B-2	16' - 16.5'	13.4	117.5
B-4	16' - 16.5'	11.6	126.6

Table 5 – Moisture-Density Tests on Tube Samples

3.3 EXISTING FILL

Approximately 2 to 5 feet of fill material (pale orange sandy silt with clay and gravel) was observed in the exploratory borings. The deepest fills were observed in the southern portion of the site towards the harbor.

A historical aerial photograph decades package was reviewed to understand how the site land use has changed over time (aerial photographs are attached in Appendix E). As seen in the earliest historical aerial photograph (1939), artificial fill was placed on the site and surrounding area prior to 1939 and the site was roughly graded with unpaved roadways. In the 1946 aerial photograph several industrial buildings occupy the site. In the 1958 aerial photograph the industrial buildings have been demolished. As seen in the 1963 aerial photograph, the existing industrial gas facility was constructed on the site sometime between 1958 and 1963.

3.4 EXCAVATION EFFORT

Based upon our exploratory borings, conventional grading equipment should be able to excavate the on-site soil with reasonable expectations, except that:

- Groundwater may complicate excavations below a depth of 10 feet requiring dewatering and possibly causing caving.
- Soft ground at a depth of approximately 5 to 8 feet in particular could cave during trenching operations.

See Section 4.2 for soil improvement recommendations.

3.5 SUITABILITY FOR CONSTRUCTION AND SITE CONCERNS

From an earthwork, pavement, and foundations viewpoint, the soils at this site are not considered suitable for support of the anticipated loads without either deep foundations or ground improvement.

Our primary concerns for the site are as follows:

1) The compressibility of the soft saturated clay soil observed between approximately 5 and 30 feet below existing grade. In particular, the zone from 5 to 10 feet below grade is especially loose/soft.

4 EARTHWORK RECOMMENDATIONS

4.1 NATIVE AND IMPORT FILL MATERIAL

On-site native soil is predominately clay and is considered suitable to be used as fill material once properly moisture conditioned, provided our recommendations are followed properly. Imported fill materials should have a plasticity index less than 12 and a maximum particle size of 3 inches. Allow Gularte & Associates 48 hours to sample and test proposed import fill materials prior to delivery at the site.

4.2 SOIL IMPROVEMENT – BUILDING PAD OR DEEP FOUNDATIONS

We used Setoff version 3.0 software by Ensoft to estimate static settlement. We modeled the calculations with a 400 psf dead load to account for the 3 feet of planned import soil and evaluated spread footing loads of 2.5 ksf. Based on the two consolidation tests, static settlement was in excess of 6 inches for the worst case loading condition of the spread footing and fill loading superimposed on each other. Based on this information, either deep foundations or soil improvement will be necessary at the project site.

Of particular concern is the very soft clay between 5 and 10 feet below existing grade and compressible clay between 10 and 20 feet below ground surface. We recommend that either the building be placed on deep foundations with a mat slab or that the site soil be improved thus allowing conventional foundations.

Possible ground improvement methods are shown below. Treatment depths of approximately 30 feet are anticipated.

A. Deep Soil Mixing: mass soil stabilization of the building pad using a cementitious binder slurry.
B. Vibro Stone Columns or aggregate piers.
C. Vibro Concrete Columns.
D. Other displacement inclusion methods.

Possible deep foundation methods are as follows:

1. Auger cast piles
2. Helical piers
3. Driven piles
4. Micropiles

Both the ground improvement and deep foundation methods are specialty methods and are often designed by a specialty design/build contractor. Some of the methods are a hybrid of soil improvement and deep foundation. Often with these methods and a 2 to 3-foot thick layer of crushed stone, aggregate baserock, or lime treated soil is placed beneath the structure to transfer loads to the hybrid foundation elements. If a specialty layer is not provided by the design/build contractor, then at a minimum a 3-foot overexcavation will be required for the

building footprint. Their individual analysis is beyond the scope of this report. Other options may be available which have not been considered as part of this report.

4.3 FILL COMPACTION

Fill should be moisture conditioned to within 0 to +4 percent of optimum water content. Compact soil for structural areas such as pavements and building pads to at least 90 percent relative compaction per ASTM D1557.

Compact the upper 6 inches of pavement subgrade and aggregate baserock to at least 95 percent relative compaction per ASTM D1557.

We strongly recommend that you retain our firm to check that our over-excavation recommendations are properly executed, as well as, to test fill placement every 12 to 18 inches and check that the soil has been compacted adequately during the grading operation.

4.4 TRENCH BACKFILL

The contractor is responsible for conducting all trenching and shoring in accordance with CALOSHA requirements. Place and compact trench backfill as follows:

- Trench backfill should have a maximum particle size of 2 inches;
- Moisture condition trench backfill to within 0 to +4 percent of optimum water content; moisture condition backfill outside the trench.
- Place fill in loose lifts not exceeding 12 inches for backhoes and 18 inches for large excavators.
- Compact soil to at least 90 percent relative compaction per ASTM D1557.
- Jetting of trench backfill is not acceptable except in joint utility trenches where damage to conduits makes mechanical compaction methods impractical.

4.5 SLOPES

Construct final slope gradients to 2.5:1 (horizontal:vertical) or flatter. Slope faces should be compacted and vegetated to reduce the effects of rutting from rainfall and overland water flow. Construct a keyway at the toe of the fill slope and at least 24 inches deep on the downhill side of the key. The keyway should be a minimum of 10 feet wide and sloped back into the slope at a minimum 5 percent slope. In order to remove loose soil/rock, excavate benches into competent material after engineered fill has been placed in the keyway per our recommendations. Benches should be cut into the existing slope as filling proceeds every 2 to 4 feet vertically and 4 to 8 feet wide into the slope, to remove loose soil/rock. We recommend that buildings have a minimum setback of 5 feet from ascending slopes and 10 feet from descending slopes, or as outlined in section 1808A.7 of the 2019 California Building Code. The setback is measured from the outermost footing line closest to the toe/hinge point of slope. Gularte &

Associates, Inc. should be retained to check footing dimensions, and their orientation to nearby slopes for conformance with the recommendations contained in this report.

4.6 SITE DRAINAGE

Surface drainage design should include the following:

1. Slope concrete pavement areas at least ½ percent and asphalt concrete pavements at least ½ and preferably 1 percent to extend pavement life. Do not allow water to pond on pavement areas.
2. If soil surrounds the building, discharge roof down spouts to storm drain system. Where soil surrounds the building, provide a 5 percent slope away from building exteriors for a distance of at least 10 feet.
3. Direct sprinklers away from buildings. Use drip irrigation near the structure and pavements. Excess watering increases to risk of premature pavement failure and shrink/swell underneath the structure.

5 FOUNDATION RECOMMENDATIONS

5.1 CONVENTIONAL FOUNDATIONS – AFTER GROUND IMPROVEMENT

If the site soil conditions is improved by one of the ground improvement methods in Section 4.2, then the proposed concrete tilt warehouse can be supported on continuous or isolated spread footings bearing in competent compacted fill per our recommendations in Section 4. Continuous footings should be a maximum 18 inches wide and 24 inches deep below finished pad grade and spread footings should be at least 36 inches wide and 24 inches deep below finished pad grade (not including crushed rock or pavement).

Table 6 below provides maximum allowable bearing capacity for dead plus live loads. These bearing capacities may be increased by one-third for the short-term effects of wind or seismic loading.

Minimum Footing Dimensions	Allowable Bearing Capacity (PSF)
Strip Footings 18” W x 24” Deep	2,500
Spread Footing 36” W x 24” Deep	3,000
Spread Footing 48” W x 24” Deep	3,400
Spread Footing 60” W x 24” Deep	3,800

Table 6 – Building Footing Parameters

Provide minimum steel reinforcing in strip footings of two No. 5 bars top and two No. 5 bars bottom.

Lateral loads may be resisted by friction along the base of footings and by passive pressure along the face of footings. The passive pressure is based on an equivalent fluid pressure in pounds per cubic foot (pcf). We recommend a passive lateral pressure of 300 pcf and a coefficient of friction equal to 0.32 for design. If passive resistance and friction are combined to resist lateral loads, we recommend that the passive pressure be reduced by 33 percent.

Utility excavations parallel to footing lines should be clear of a 1:1 (horizontal:vertical) plane projected downward from the base of footings. Where utility lines cross footings, they should be sleeved and footings deepened as appropriate. We should review these conditions and provide specific recommendations.

5.2 SLAB ON GRADE

We recommend the following for slabs-on-grade:

1. Place a minimum of 6 inches of Caltrans Class II aggregate baserock (AB) compacted to at least 95 percent relative compaction.
2. Place a minimum 15-mil Stego Wrap vapor barrier between the pad and AB or alternatively over the AB. Pouring slab directly on vapor barrier in warm weather could be problematic for proper curing of slab; contractor to take necessary precautions. *Note: Where moisture migration is not a concern to the end user, vapor barrier may be omitted provided there will be no flooring over the concrete slab nor storing any boxes directly on the slab for extended periods. This is only applicable in warehouse areas.*
3. Provide a minimum concrete thickness of 8 inches.
4. Reinforce slabs with No. 5 reinforcing bars placed on 24-inch centers each way. Place dobies per ACI; we recommend a maximum dobie spacing of 6 feet on center, each way.
5. Use a concrete water-cement ratio of 0.50 or less for the slab; may be further modified by structural engineer requirements.
6. Use higher strength concrete, minimum 3,500 psi for the slab; may be further modified by structural engineer requirements.

Slab thickness and reinforcing steel requirements above are provided for purposes of resisting soil expansion potential. The structural engineer may increase these parameters based on building loads or anticipated building use. The structural engineer should provide final design thickness and additional reinforcement, if necessary, for the intended structural loads.

Exterior Flatwork: Exterior flatwork includes items such as concrete sidewalks, steps, and outdoor courtyards exposed to foot traffic only. Provide a minimum concrete flatwork thickness of 4 inches over 4 inches of aggregate base. Exterior flatwork subgrade should be moisture conditioned to within 0 to +4 percent of optimum water content and compacted to at least 90 percent relative compaction per ASTM D1557.

5.3 RETAINING WALL PARAMETERS

Provided that adequate drainage is included, we recommend that walls subjected to active soil pressure be designed to resist an equivalent fluid pressure of 46 pounds per cubic foot (pcf). For at-rest conditions, we recommend an at-rest fluid pressure of 68 pcf with level backfill conditions. Retaining wall backfill should be predominantly granular, non-expansive backfill. Generally, we expect horizontal movements for retaining walls under active pressure conditions to rotate laterally an amount equal to 1 percent of the height of the wall.

The above lateral earth pressures assume sufficient drainage behind the walls to prevent any build-up of hydrostatic pressures (i.e. sump) from surface water infiltration and/or a rise in the ground water level. Drainage of the walls may be accomplished by one of the following methods:

1. Clean drain rock wrapped in Mirafi 140N non-woven filter fabric or equivalent as approved by our office. Drain rock should be ¾ to 1-1/2 inch in size and should have less than 5 percent passing the No. 200 sieve. Rock can be crushed or rounded. Drain rock should be 12 inches wide and extend to within 12 inches of subgrade.
2. Caltrans Class II Permeable material placed 12 inches wide and extended to within 12 inches of subgrade. The Caltrans Class II Permeable is self filtering; and as such a geotextile filter fabric is not necessary.
3. Geocomposite drainage can be used in lieu of crushed rock. We commonly recommend Amerdrain C96 geocomposite drainage board. The product should be installed per the manufacturer's directions. We recommend the wider drainage board be placed in the lower 2 feet of the wall. It is important that the proper transition pieces are used to transition from the geocomposite to 4-inch tight pipe for outletting purposes.

In either of the above cases, we recommend waterproofing of the walls with a product such as Masterseal 5000-R or equivalent as reviewed and approved by our office in writing. Waterproofing should be applied per the manufacturer's instructions.

Water collected at the bottom of the drain system should be transmitted away from the wall by a perforated pipe or weep holes. The pipe should be at least four inches in diameter with the perforations placed down (lettering typically on top). The pipe should daylight to a lower grade or connect to a sump, storm drain, or other suitable disposal facility. If adequate drainage is not provided, we recommend that an additional equivalent fluid pressure of 40 pcf be added to the values recommended above.

5.4 2019 CBC SEISMIC PARAMETERS

We provide the 2019 California Building Code parameters in the table below. See also, Figure 4 for the peak ground acceleration as a function of probability of exceedance in 50 years. Based on the 2008 ground motion interpolator by the California Geological Survey, the site has a peak ground acceleration of 0.562g and 0.876g for 10 percent and 2 percent probability of exceedance in 50 years, respectively.

Categorization	Design Value
Site Latitude	37.926033
Site Longitude	-122.376826
Site Class	D
Risk Category	II
MCE_R Ground Motion 0.2 second period (S_S)	1.686
MCE_R Ground Motion 1.0 second period (S_1)	0.638
Site Amplification Factor at 0.2 second (F_a)	1.0
Site Amplification Factor at 1.0 second (F_v)	1.7
Site Modified Spectral Acceleration (S_{MS})	1.686
Site Modified Spectral Acceleration (S_{M1})	1.085
Numeric Seismic Design Value (S_{DS})	1.124
Numeric Seismic Design Value (S_{D1})	0.723
Seismic Design Category	D

Table 7 – 2019 CBC Seismic Parameters

5.5 PAVEMENT DESIGN

5.5.1 Asphalt Concrete Pavement

We prepared several different asphalt pavement sections as shown in the table below. Our untreated subgrade pavement design and were based on an R-value of 5, using Procedure 608 of the Caltrans Highway Design Manual. Based on import fill material planned for the site, we recommend that R-value tests be conducted on soil that will become subgrade materials. Contact our office for an alternative pavement design such as lime treated subgrade, if so desired.

	Traffic Index						
	4.5	5	6	7	8	9	10
Asphalt Concrete (in)	2.5	2.5	3.5	4	4.5	5.5	6
Aggregate Base (in) Untreated Subgrade	9	11	13	16	19	21	24

Table 8 – Pavement Sections

5.5.2 Trash Enclosure Portland Cement Concrete Pavement Design

Use concrete pavement sections to resist heavy loads and turning forces in trash enclosures. We recommend the following minimum design sections for trash enclosure rigid pavements:

- Place 7-inches of concrete over 6-inches of aggregate base compacted to at least 95 percent relative density per ASTM D1557.
- Concrete pavement should have a minimum 28-day compressive strength of 3,000 psi.
- Provide minimum control joint spacing in accordance with Portland Cement Association guidelines.
- Reinforce slabs with No. 5 reinforcing bars placed on 24-inch centers, each way, placed within the middle third of the slab. Place dobies per ACI. If shrinkage cracking is acceptable and the concrete is not subject to heavy truck traffic, then reinforcing bar could be replaced with the appropriate type and amount of fiber mesh.

Note, the above pavement section recommendation is designed for trash enclosures only and should not be used for Portland cement concrete trucking driveway or loading dock apron slabs. Please contact our office should you require a PC concrete slab design for trucking driveways or loading dock aprons.

5.6 SPECIAL INSPECTIONS

We recommend the following minimum special inspections as part of the grading and foundation portions of the project. The project architect, governing agency, or structural engineer may require other inspections.

- Observation of existing structure demolition and abandoned utility line demolition.
- Observation of the ground improvement methods or deep foundations.
- Compaction testing during grading and trench backfill.
- Observation of footing excavations.
- Observation of reinforcing steel for foundations and slabs.
- Observation, sampling, and testing of concrete.

6 LIMITATIONS

The scope of this evaluation was limited to an evaluation of the load-carrying capabilities and stability of the subsoils. Oil, hazardous waste, radioactivity, irritants, pollutants, molds, or other dangerous substance and conditions were not the subject of this study. Their presence and/or absence is not implied or suggested by this report and should not be inferred.

The accompanying report summarizes the findings and opinions of Gularte & Associates, Inc. Our findings and opinions are based on information obtained on given dates by borings, laboratory testing, engineering judgment, and analyses.

The analyses, conclusions, and recommendations contained in our report are based on site conditions as they existed at the time of our study, and further assume that probes such as exploratory borings are representative of the subsurface conditions throughout the site; i.e., the subsurface conditions everywhere are not significantly different from those disclosed by the probes.

If during construction different subsurface conditions from those encountered during our exploration or different from those assumed in design are observed or appear to be present, or where variations from our design recommendations are made, we must be advised promptly so that we can review these conditions and modify the applicable recommendations if necessary. We cannot be held responsible for differing site conditions, changes in design, or modified geotechnical recommendations not brought to our attention.

Soil conditions cannot be fully determined by borings and, therefore, unanticipated soil conditions are commonly encountered. Such unexpected soil conditions often require that additional expenditures be made to attain a properly constructed project. Therefore, some contingency funding is recommended to accommodate potential extra costs.

Foundation dimensions, minimum slab thickness, and reinforcing details recommended herein are based upon geotechnical and construction considerations and are not offered in lieu of foundation design by an engineer. A determination of flooding potential, the existence of wetlands, or corrosive soil was beyond the scope of this report.

This geotechnical study did not include an investigation regarding the existence, location, or type of possible hazardous materials. If an investigation is necessary, we should be advised. In addition, if any hazardous materials are encountered during construction of the project, the proper regulatory officials should be notified immediately.

This report was prepared for the specific use of our client and applies only to the subject property. We are not responsible for interpretations by others of data presented in this report. This report is not a legal opinion. No warranty is expressed or implied. We base our conclusions in this report on judgment and experience. We performed this work in accordance with generally accepted standards of practice existing in northern California at the time of the report.

Gularte & Associates, Inc. is not an expert on mold prevention. If particular recommendations are desired to prevent mold, we recommend that you contact an expert in that field.

FIGURES

Figure 1 – Vicinity Map

Figure 2 – Site Plan

Figure 3 – Geologic Map

Figure 4 – Seismic Hazard Accelerations

Figure 5 – Seismic Hazard Zones Map



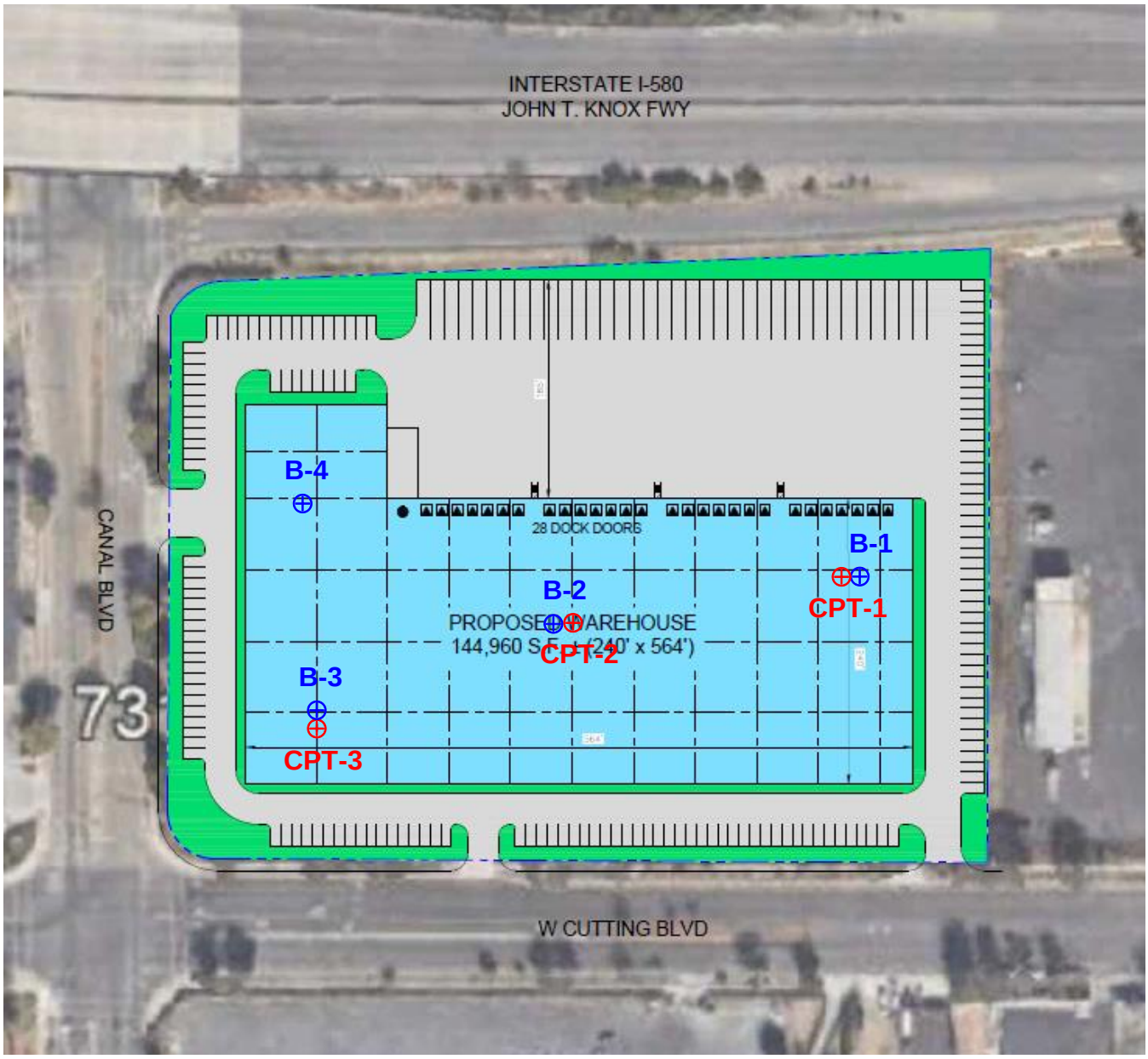
Vicinity Map

731 W Cutting Blvd – Richmond

(APN: 550-030-007-3)

Gularte & ASSOCIATES INC.
Geotechnical Consultants
P.O. Box 490 ▼ Lincoln, CA 95648
916.771.5051 FAX 916.771.5868

October 2020	Job No. 4739	Figure 1



Legend:

⊕ **B-X Boring Location**

⊕ **CPT-X Proposed CPT Location**

N

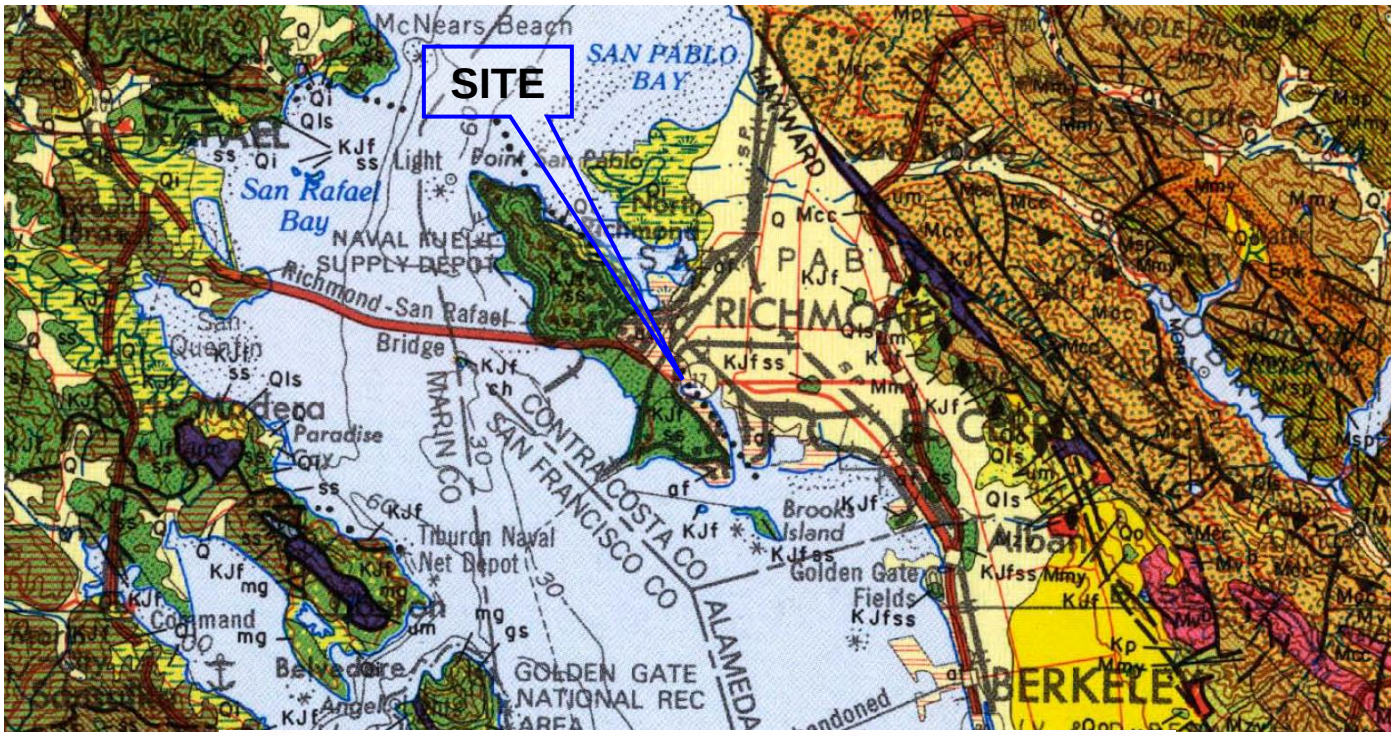
Site Plan

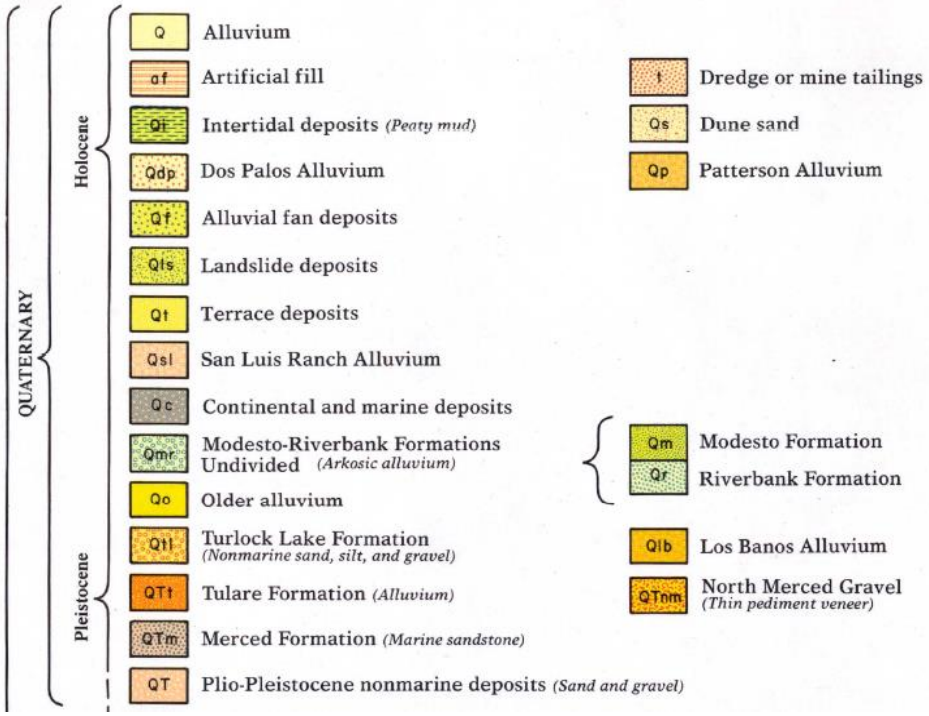
731 W Cutting Blvd. – Richmond

(APN: 550-030-007-3)

Gularte & ASSOCIATES INC. Geotechnical Consultants

October 2020	Job No. 4739	Figure 2





N

Adapted from the 1991 CA DMG Geologic Map of the San Francisco-San Jose Quadrangle, California.

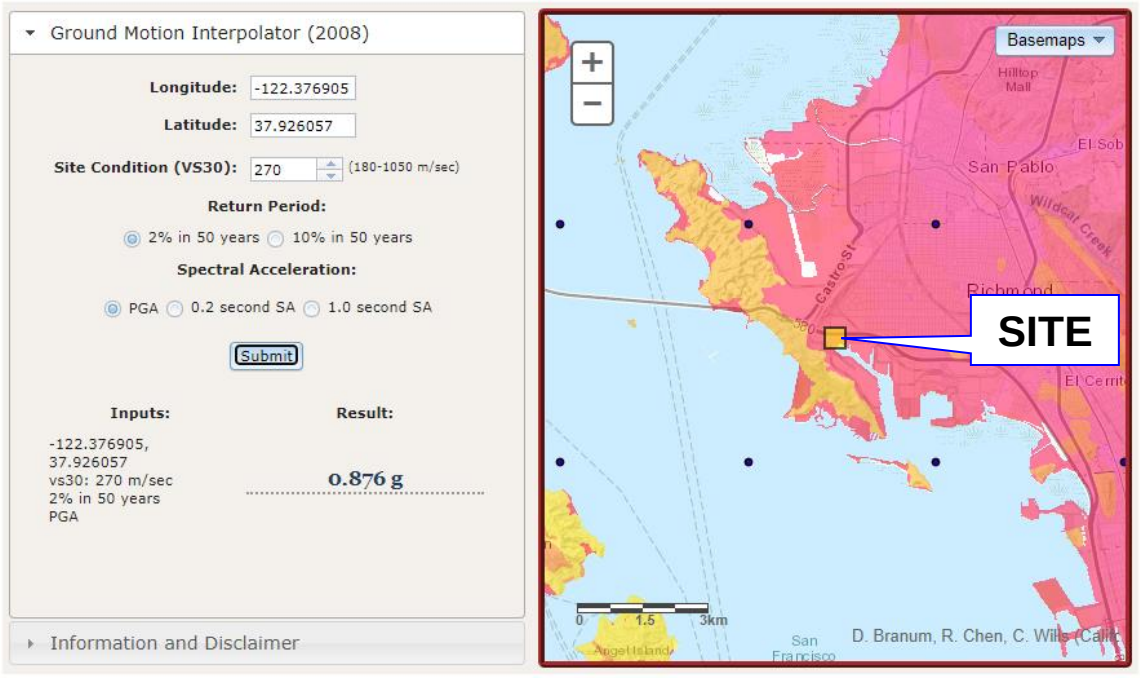
Geologic Map

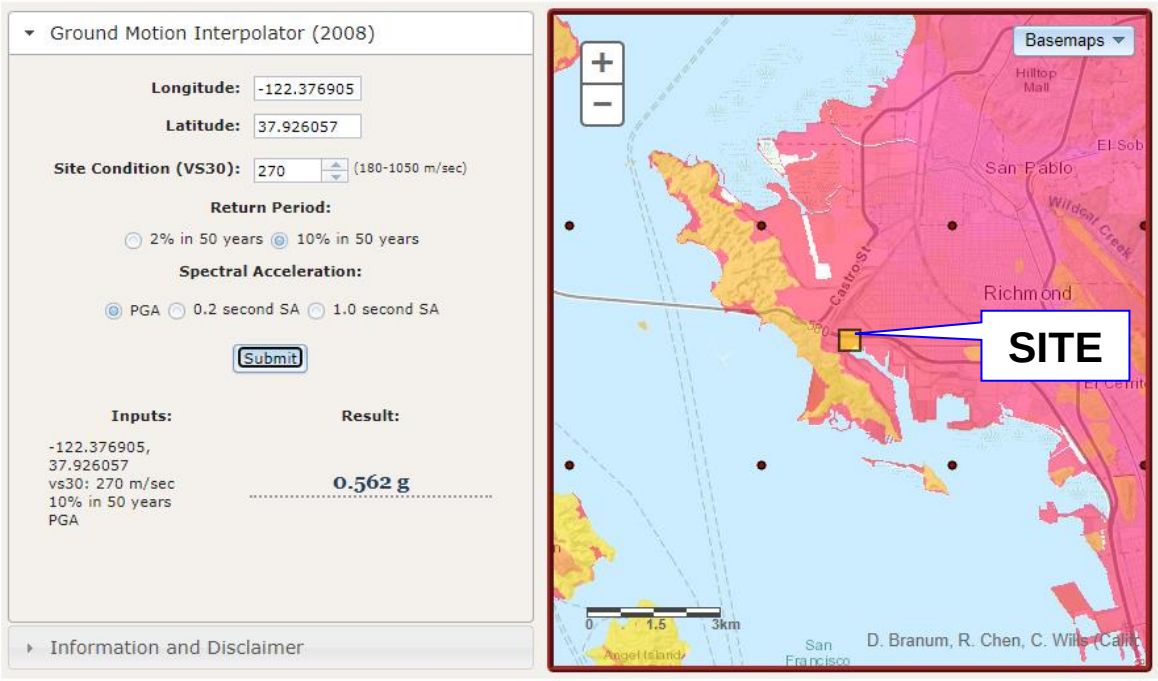
731 W Cutting Blvd. – Richmond

(APN: 550-030-007-3)

Gularte & ASSOCIATES INC. Geotechnical Consultants

October 2020	Job No. 4739	Figure 3





N

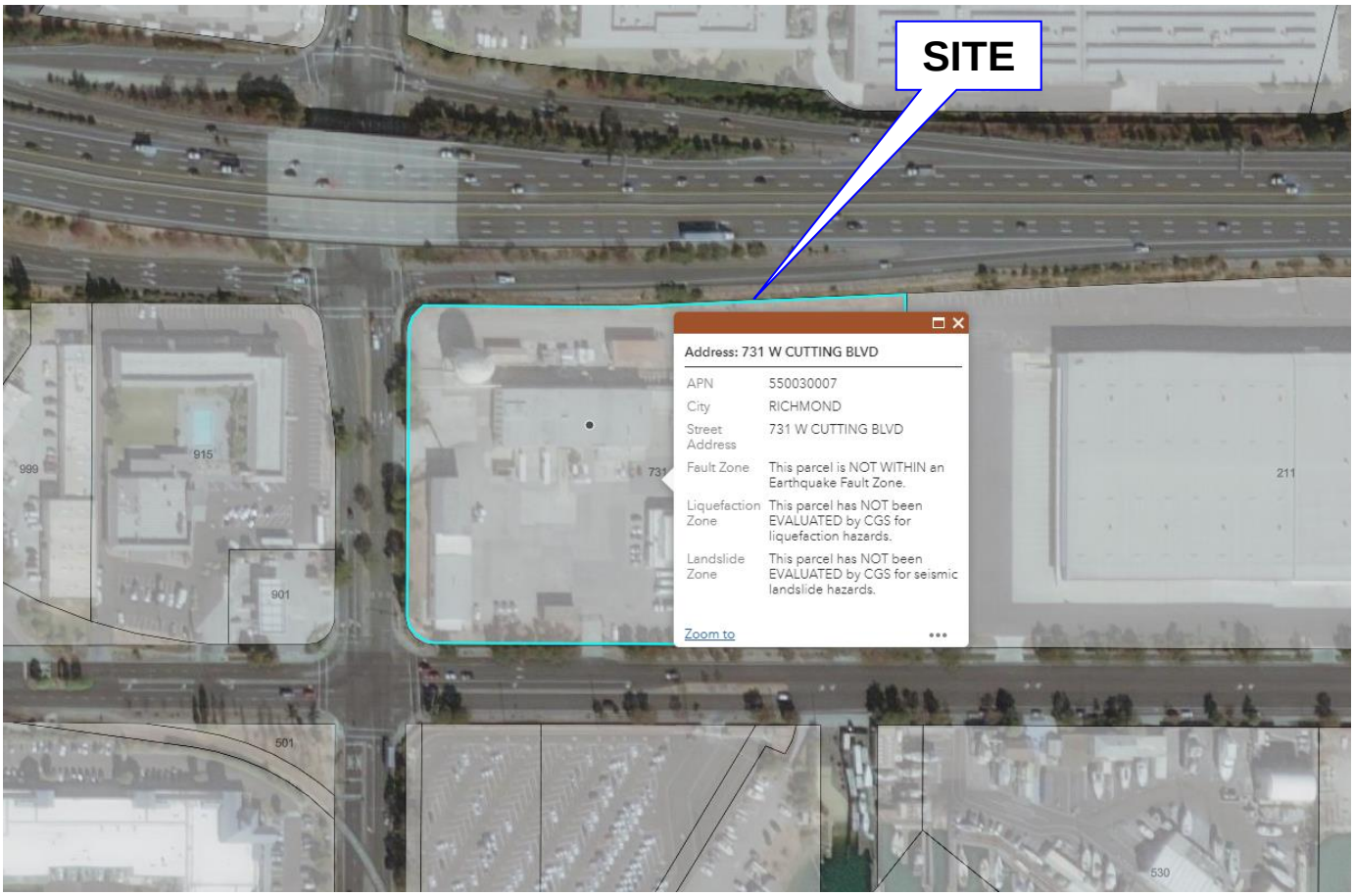
Seismic Hazard Accelerations

731 W Cutting Blvd. – Richmond

(APN: 550-030-007-3)

Gularte & ASSOCIATES INC. Geotechnical Consultants

October 2020	Job No. 4739	Figure 4



Explanation:

- Parcel is in an Earthquake Fault Zone, a Liquefaction Zone, and a Landslide Zone
- Parcel is in an Earthquake Fault Zone and a Liquefaction Zone
- Parcel is in an Earthquake Fault Zone and a Landslide Zone
- Parcel is in an Earthquake Fault Zone
- Parcel is in a Liquefaction Zone and Landslide Zone
- Parcel is in a Liquefaction Zone
- Parcel is in a Landslide Zone
- Parcel is not in a zone or has not been evaluated

N

Adapted from the CGS Earthquake Zones of Required Investigation

Map of Seismic Hazard Zones

731 W Cutting Blvd. – Richmond

(APN: 550-030-007-3)

Gularte & ASSOCIATES INC. Geotechnical Consultants

October 2020	Job No. 4739	Figure 5

APPENDIX A

Boring Logs

Auger	Solid Stem t/15'; Mud Rotary t/51'	**Project No.**	4739
Size	SS 4-in ; MR 4.75-in	**Project Name**	731 W Cutting Blvd
Drill	CME 75	**Elevation**	~10-ft MSL
Logged By	J. Zlotkowski	**Date**	September 30, 2020

Gularte & Associates, Inc.

Boring # B-1

Depth (feet)	Sample No.	SPT/Cal Mod N-Value	Sample Type	LITHOLOGIC DESCRIPTION	SPT or Cal Mod "N" Value (Uncorrected)
0				Asphalt: 3-in	
				Fill: Silty SAND with clay and gravel, pale orange, moist, dense.	
	1.1 1.2	4/6/7	Bulk CAL	Clay: (CH) blue gray, saturated, soft to medium stiff, saturated. PP = 1.0 tsf.	0 20 40 60 80 100
5	1.3	1/1/1	SPT		0 20 40 60 80 100
				Note: Sidewalls squeezing CalMod sampler at 10-ft bgs.	
10	1.4	2/3/5	CAL		0 20 40 60 80 100
				Silty Clay: (CL) gray green, saturated, medium stiff. PP = 1.0 tsf Note: Groundwater at 12.5-ft bgs.	
				Clayey Sand: (SC) brown, saturated, very loose. Note: Mud Rotary f/15-ft bgs.	0 20 40 60 80 100
15	1.5	1/3/5	SPT	Clay: (CH) olive brown, very wet, medium stiff.	
				Silty Clay: (CL) olive brown to light gray, very wet, medium stiff to stiff.	0 20 40 60 80 100
20	1.6	5/7/6	SPT		
25	1.7	6/8/7	SPT		0 20 40 60 80 100
				Sandy Clay: with silt (CL), light brown, very wet, medium stiff.	
30					

Client	Project	Sheet
Duke Realty	731 W Cutting Blvd - Richmond	1 of 2

Auger	Solid Stem t/15'; Mud Rotary t/51'	**Project No.**	4739
Size	SS 4-in ; MR 4.75-in	**Project Name**	731 W Cutting Blvd
Drill	CME 75	**Elevation**	~10-ft MSL
Logged By	J. Zlotkowski	**Date**	September 30, 2020

Gularte & Associates, Inc.

Boring # B-1

Depth (feet)	Sample No.	SPT/Cal Mod N-Value	Sample Type	Lithology	LITHOLOGIC DESCRIPTION	SPT or Cal Mod "N" Value (Uncorrected)	Depth (feet)
30							30
	1.8	3/3/5	SPT		Silty Clay: (CL) brown, very wet, medium stiff.		
					Silty Sand: (SM) dark brown, saturated, loose.		
					Silty Clay: (CL) brown, saturated, medium stiff.	0 20 40 60 80 100	
35							35
	1.9	5/6/6	SPT		Sandy Silt: (ML) dark olive, very wet, stiff.		
					Silty Clay: (CL) grayish olive, very wet, stiff.		
					Clayey Silt: with sand (ML) blue gray, very wet, stiff.	0 20 40 60 80 100	
40							40
	1.10	7/10/11	SPT		Sandy Silt: with clay (ML) blue gray, wet, very stiff.		
					Clayey Silt: (ML) blue gray, wet, very stiff.		
					Silty Clay: (CL) blue gray, wet, very stiff.	0 20 40 60 80 100	
45							45
	1.11	5/7/10	SPT				
						0 20 40 60 80 100	
50							50
	1.12	7/10/13	SPT				
					TD at 51-ft bgs; Cement to Surface.		
						0 20 40 60 80 100	
55							55
60							60

Client	Project	Sheet
Duke Realty	731 W Cutting Blvd - Richmond	2 of 2

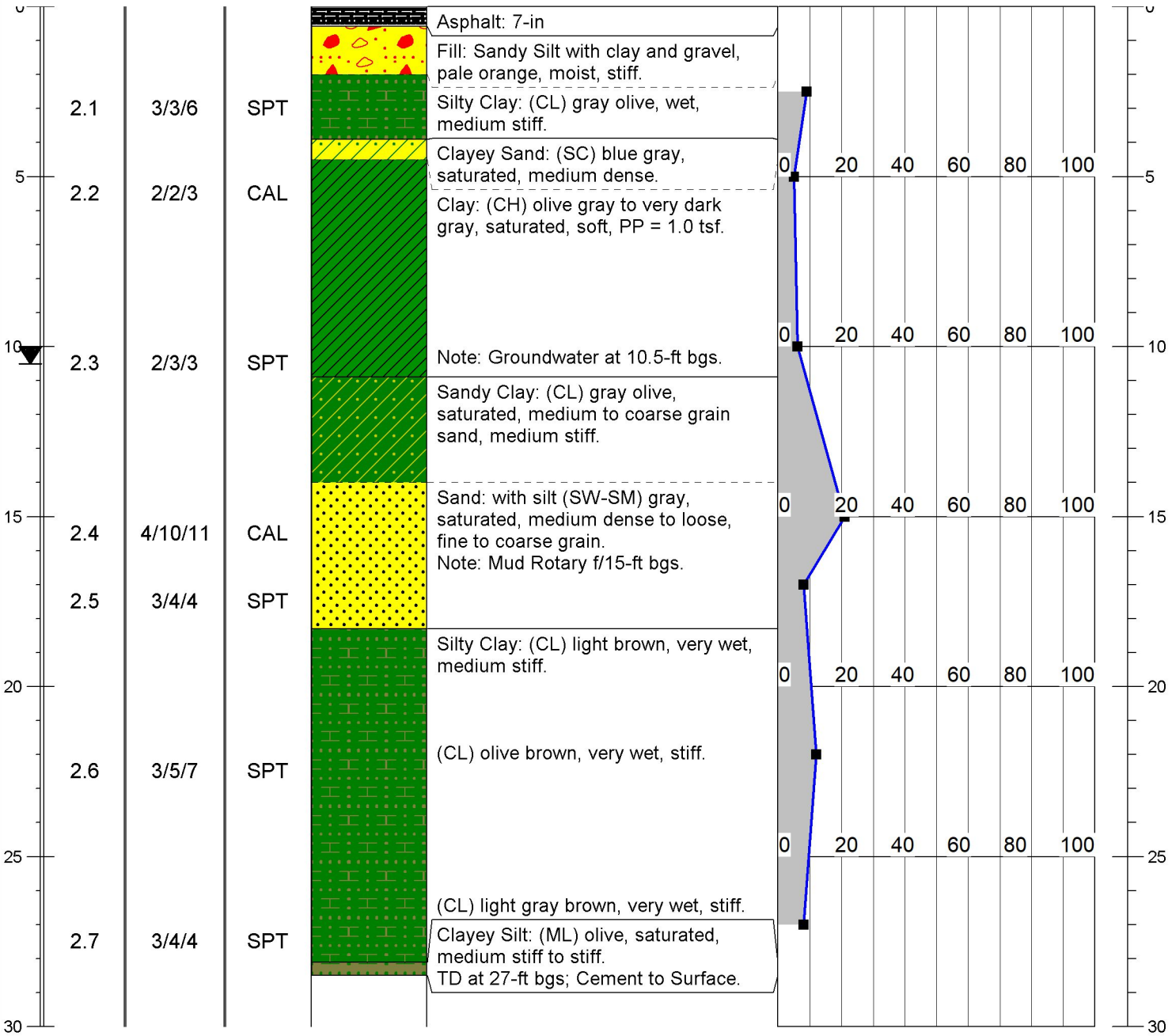
Auger	Solid Stem t/15'; Mud Rotary t/27'	**Project No.**	4739
Size	SS 4-in ; MR 4.75-in	**Project Name**	731 W Cutting Blvd
Drill	CME 75	**Elevation**	~10-ft MSL
Logged By	J. Zlotkowski	**Date**	September 30, 2020

Gularte & Associates, Inc.

Boring # B-2

Depth (feet)	Sample No.	SPT/Cal Mod N-Value	Sample Type	Lithology	LITHOLOGIC DESCRIPTION
0					Asphalt: 7-in
					Fill: Sandy Silt with clay and gravel, pale orange, moist, stiff.
	2.1	3/3/6	SPT		Silty Clay: (CL) gray olive, wet, medium stiff.
5	2.2	2/2/3	CAL		Clayey Sand: (SC) blue gray, saturated, medium dense.
					Clay: (CH) olive gray to very dark gray, saturated, soft, PP = 1.0 tsf.
10	2.3	2/3/3	SPT		Note: Groundwater at 10.5-ft bgs.
					Sandy Clay: (CL) gray olive, saturated, medium to coarse grain sand, medium stiff.
15	2.4	4/10/11	CAL		Sand: with silt (SW-SM) gray, saturated, medium dense to loose, fine to coarse grain. Note: Mud Rotary f/15-ft bgs.
	2.5	3/4/4	SPT		
20					Silty Clay: (CL) light brown, very wet, medium stiff.
	2.6	3/5/7	SPT		(CL) olive brown, very wet, stiff.
25					(CL) light gray brown, very wet, stiff.
	2.7	3/4/4	SPT		Clayey Silt: (ML) olive, saturated, medium stiff to stiff. TD at 27-ft bgs; Cement to Surface.
30					

SPT or Cal Mod "N" Value (Uncorrected)



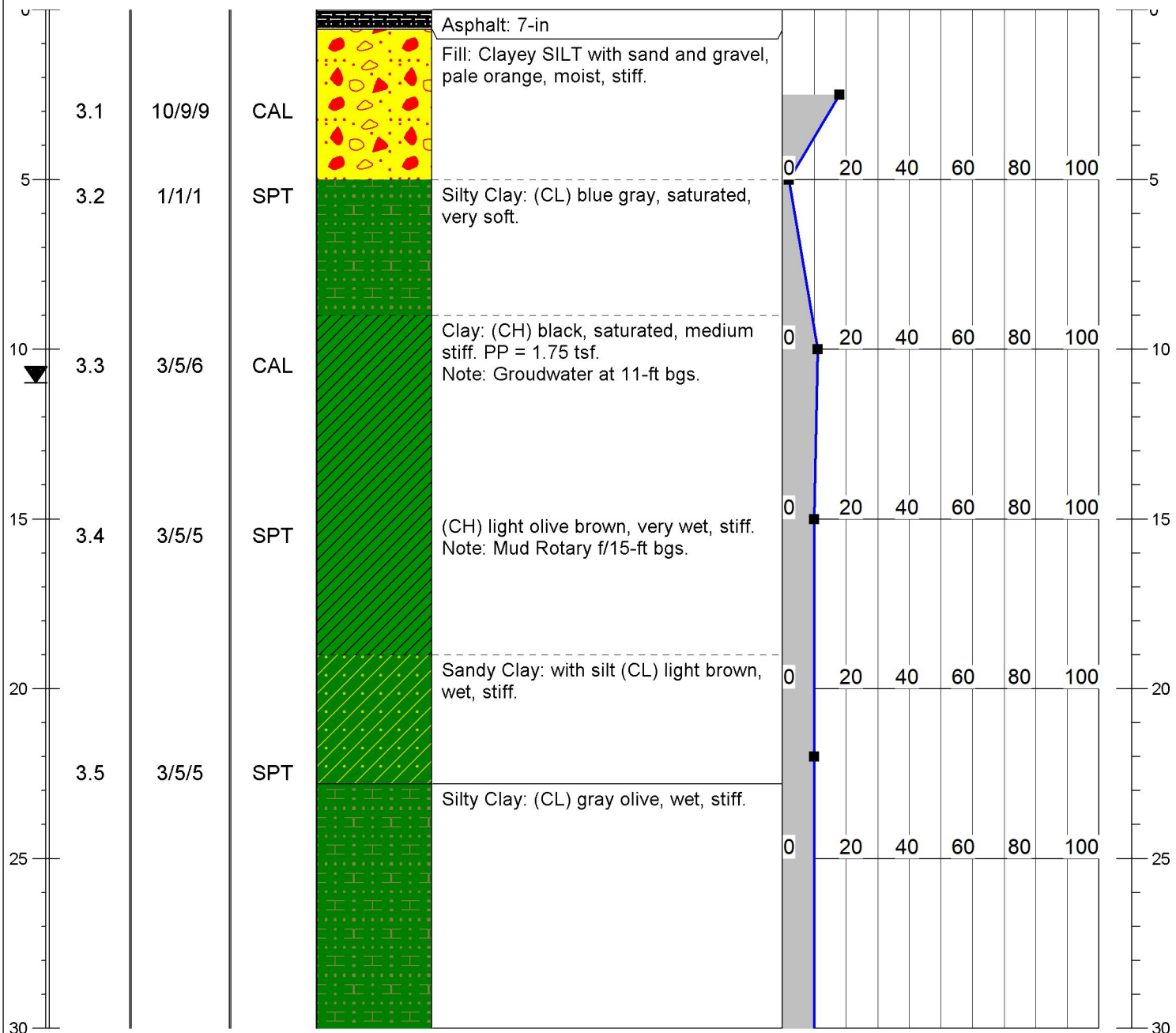
Client	Project	Sheet
Duke Realty	731 W Cutting Blvd - Richmond	1 of 1

Auger	Solid Stem t/15'; Mud Rotary t/52'	**Project No.**	4739
Size	SS 4-in ; MR 4.75-in	**Project Name**	731 W Cutting Blvd
Drill	CME 75	**Elevation**	~10-ft MSL
Logged By	J. Zlotkowski	**Date**	September 30, 2020

Gularte & Associates, Inc.

Boring # B-3

Depth (feet)	Sample No.	SPT/Cal Mod N-Value	Sample Type	Lithology	LITHOLOGIC DESCRIPTION	SPT or Cal Mod "N" Value (Uncorrected)	Depth (feet)
0					Asphalt: 7-in		0
	3.1	10/9/9	CAL		Fill: Clayey SILT with sand and gravel, pale orange, moist, stiff.		
5	3.2	1/1/1	SPT		Silty Clay: (CL) blue gray, saturated, very soft.		5
10	3.3	3/5/6	CAL		Clay: (CH) black, saturated, medium stiff. PP = 1.75 tsf. Note: Groudwater at 11-ft bgs.		10
15	3.4	3/5/5	SPT		(CH) light olive brown, very wet, stiff. Note: Mud Rotary f/15-ft bgs.		15
20					Sandy Clay: with silt (CL) light brown, wet, stiff.		20
	3.5	3/5/5	SPT		Silty Clay: (CL) gray olive, wet, stiff.		
25							25
30							30



Client	Project	Sheet
Duke Realty	731 W Cutting Blvd - Richmond	2 of 2

Auger	Solid Stem t/15'; Mud Rotary t/52'	**Project No.**	4739
Size	SS 4-in ; MR 4.75-in	**Project Name**	731 W Cutting Blvd
Drill	CME 75	**Elevation**	~10-ft MSL
Logged By	J. Zlotkowski	**Date**	September 30, 2020

Gularte & Associates, Inc.

Boring # B-3

Depth (feet)	Sample No.	SPT/Cal Mod N-Value	Sample Type	Lithology	LITHOLOGIC DESCRIPTION	SPT or Cal Mod "N" Value (Uncorrected)	Depth (feet)
35	3.6	2/4/6	SPT		Silty Clay: with sand (CL) gray olive, wet, stiff. Losing Fluid, Possible Sand Beds.	0 20 40 60 80 100	35
40	3.7	4/5/6	SPT		Clay: with silt (CL) gray green, wet, stiff.	0 20 40 60 80 100	40
45						0 20 40 60 80 100	45
50					Clayey Silt: with sand (ML) green gray, saturated, stiff.	0 20 40 60 80 100	50
55	3.8	6/7/6	SPT		Silty Clay: (CL) green gray, saturated, very wet, stiff. TD at 52-ft bgs; Cement to Surface.	0 20 40 60 80 100	55
60							60

Client	Project	Sheet
Duke Realty	731 W Cutting Blvd - Richmond	2 of 2

Auger	Solid Stem t/15'	**Project No.**	4739
Size	4-inch	**Project Name**	731 W Cutting Blvd
Drill	CME 75	**Elevation**	~10-ft MSL
Logged By	J. Zlotkowski	**Date**	October 1, 2020

Gularte & Associates, Inc.

Boring # B-4

Depth (feet)	Sample No.	SPT/Cal Mod N-Value	Sample Type	Lithology	LITHOLOGIC DESCRIPTION
0					Asphalt: 3-in
					Fill: Clayey Sandy SILT with gravel, pale orange, moist, stiff.
	4.1	3/4/4	SPT		Silty Clay: (CL) light brown, wet, medium stiff.
5					Silty Clay: with sand (CL) gray green, wet, medium stiff.
	4.2	2/2/3	CAL		Clayey Sand: with silt (SC) gray green, wet, loose.
					Clay: (CH) green gray, saturated, soft. PP = 0.5 tsf.
10					(CH) black, saturated, soft.
	4.3	0/2/3	SPT		Silty Clay: with sand (CL) pale green gray, saturated, medium stiff.
15					Sand: with silt (SW-SM) gray, saturated, medium dense to loose, medium to coarse grain. Note: Groundwater at 12.5-ft bgs.
	4.4	2/9/19	CAL		
	4.5	4/4//5	SPT		Clay: with silt (CL) brown olive, very wet, stiff. TD at 15-ft bgs; Cement to Surface.
20					
25					
30					

SPT or Cal Mod "N" Value (Uncorrected)

0 20 40 60 80 100

Depth (feet)

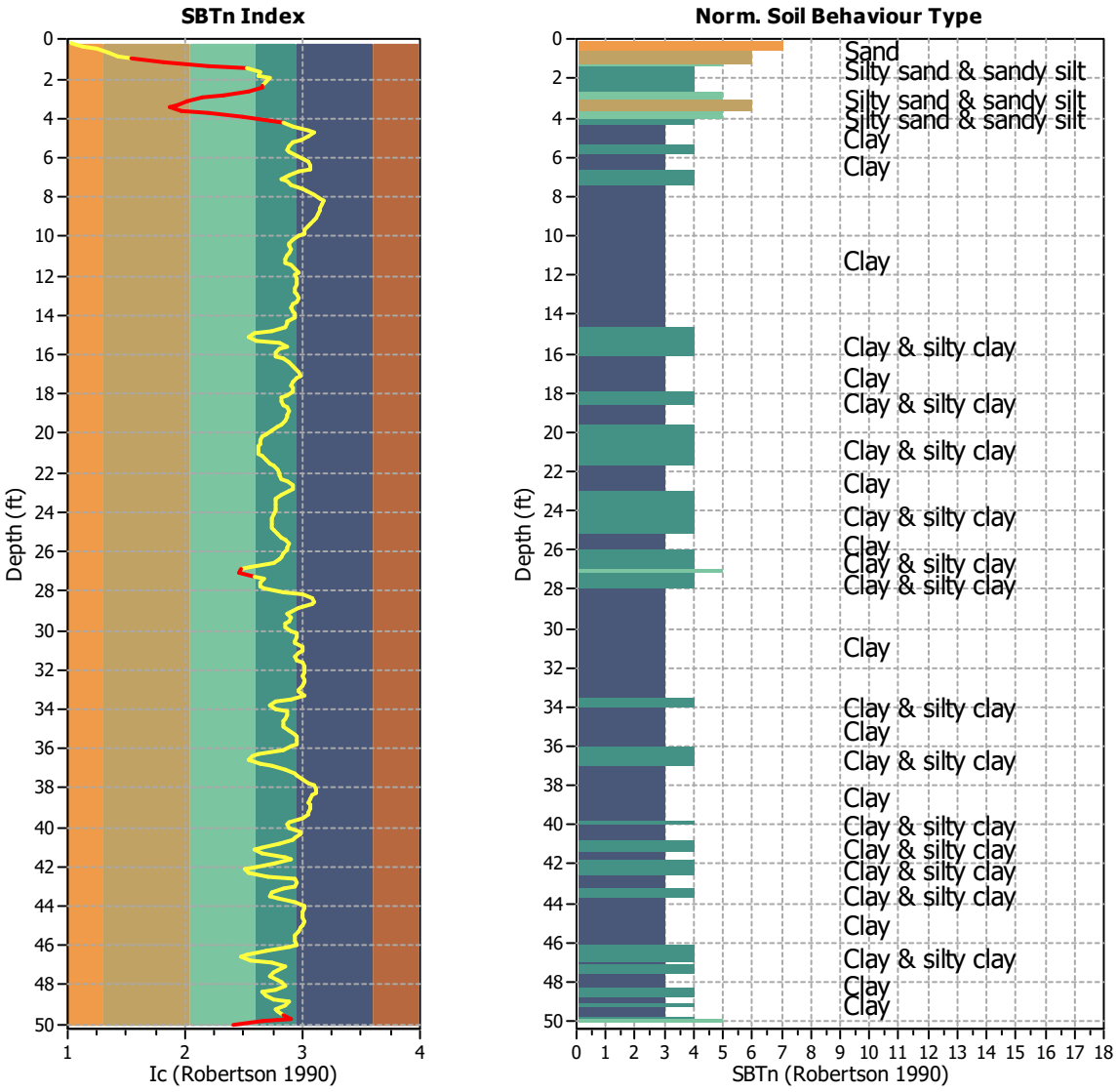
Client	Project	Sheet
Duke Realty	731 W Cutting Blvd - Richmond	1 of 1

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0200
Minimum number of points in layer:	3

General statistics

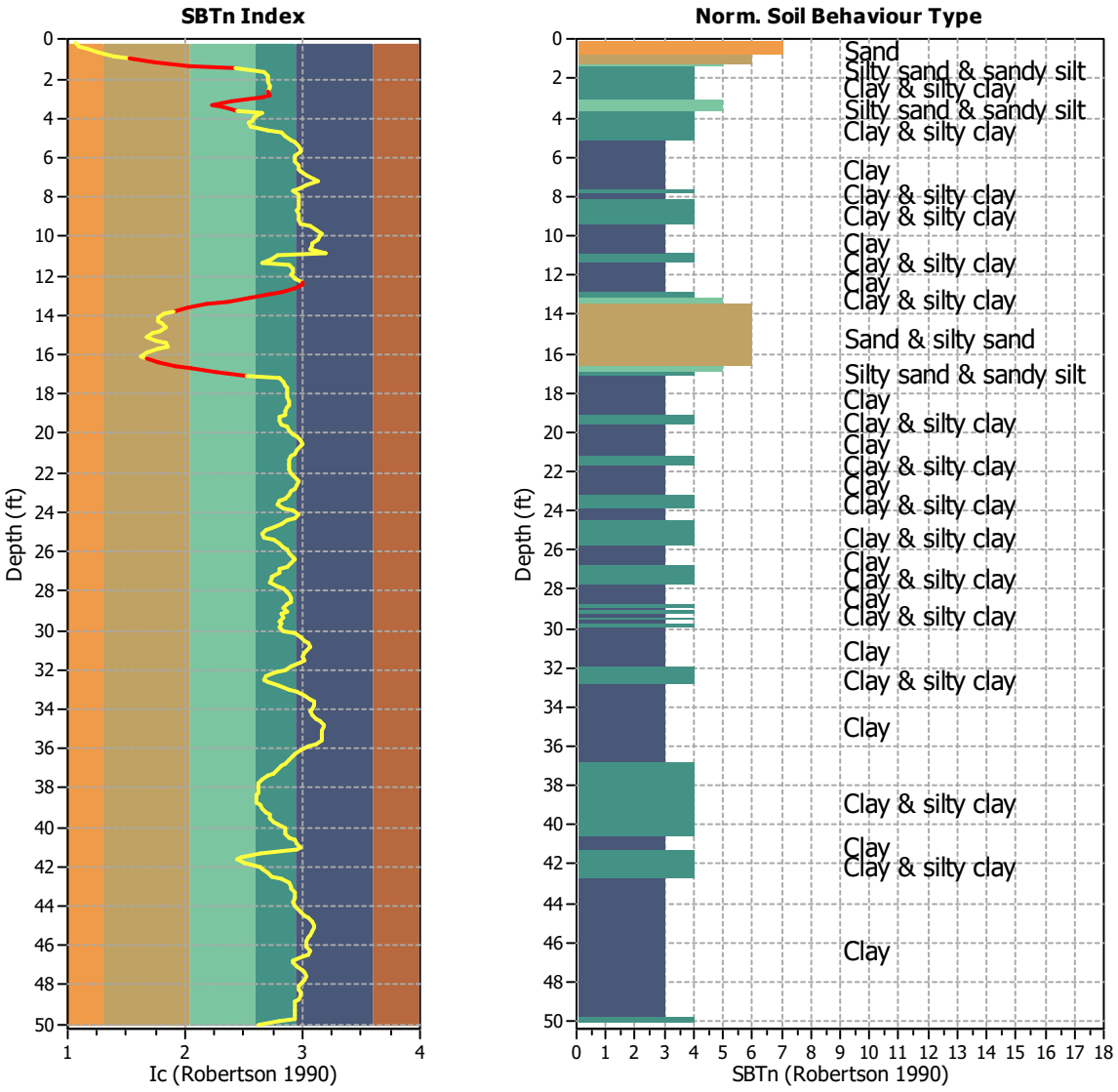
Total points in CPT file:	306
Total points excluded:	24
Exclusion percentage:	7.84%
Number of layers detected:	5

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties	
I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0200
Minimum number of points in layer:	3

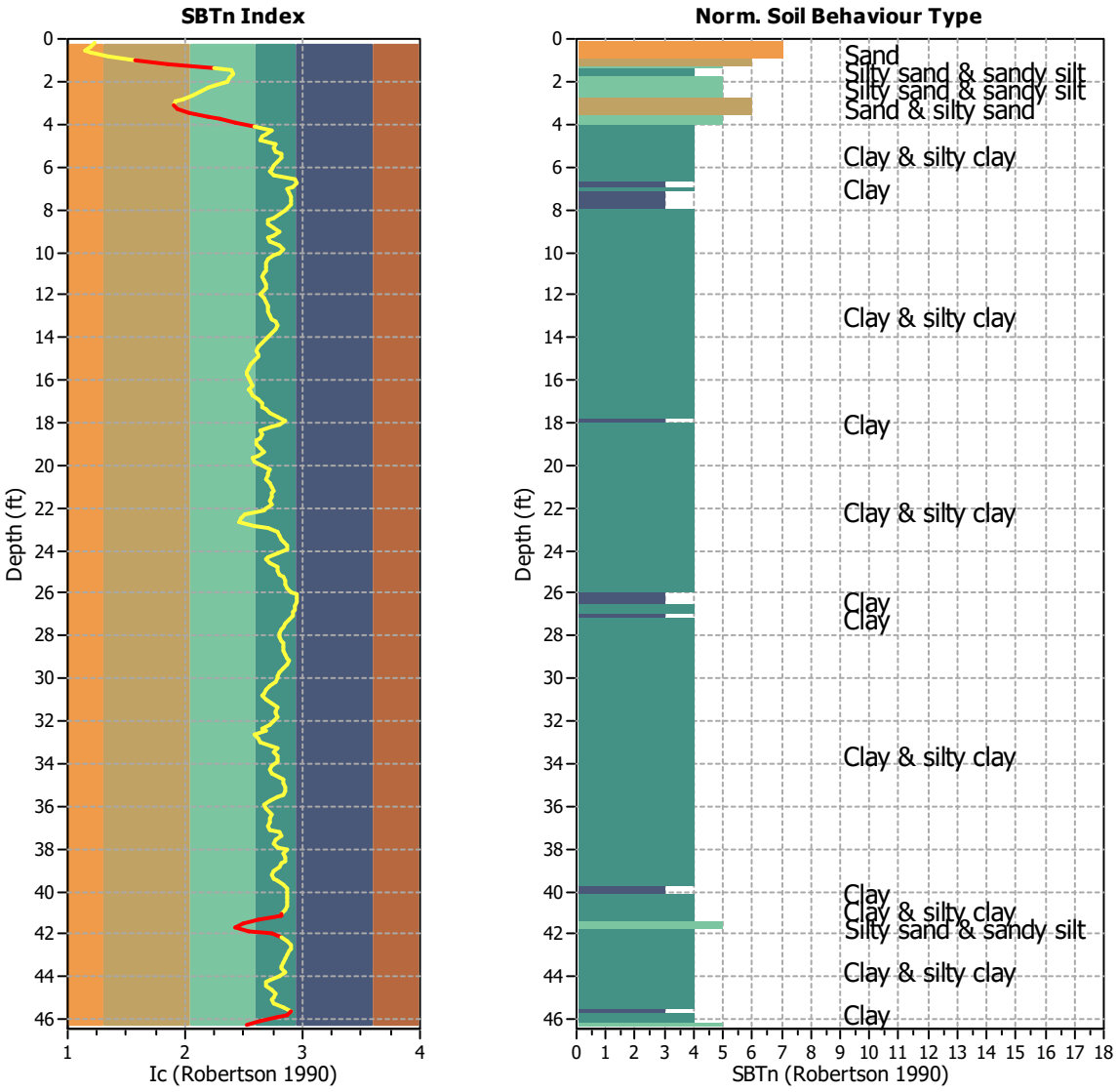
General statistics	
Total points in CPT file:	306
Total points excluded:	28
Exclusion percentage:	9.15%
Number of layers detected:	5

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0200
Minimum number of points in layer:	3

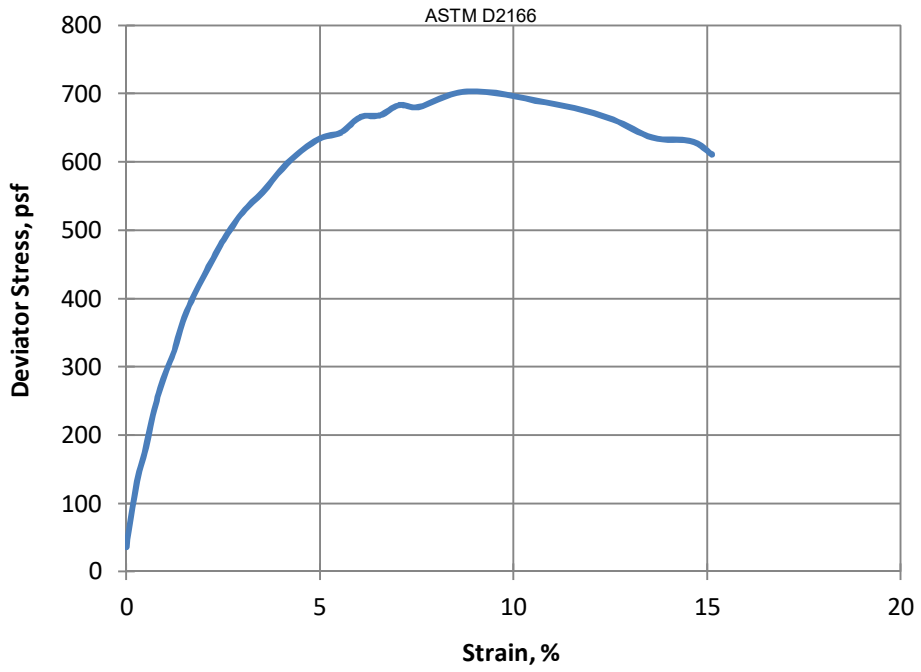
General statistics

Total points in CPT file:	282
Total points excluded:	23
Exclusion percentage:	8.16%
Number of layers detected:	5

APPENDIX B

Laboratory Test Results

STRESS-STRAIN



Failure Photo

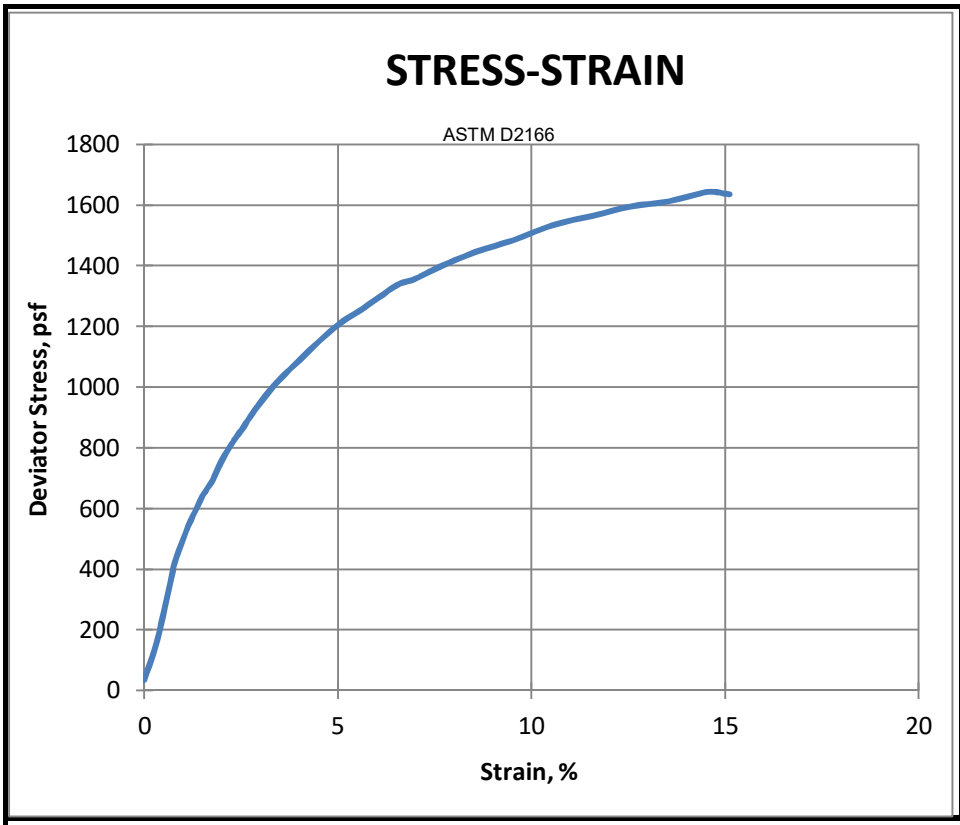


Sample Description	
Sample ID	B2-6-6.5
Sample Depth (feet)	6-6.5
Material Description	Dark greenish gray Fat CLAY
Initial Conditions at Start of Test	
Height (inch) average of 3	4.96
Diameter (inch) average of 3	2.38
Moisture Content (%)	45.6
Dry Density (pcf)	75.7
Estimated Specific Gravity	2.7
Saturation (%)	99.8
Shear Test Conditions	
Strain Rate (%/min)	1.0007
Major Principal Stress at Failure (psf)	320
Strain at Failure (%)	1.4
Test Results	
Unconfined Compressive Strength (tons/ft^2)	0.2
Unconfined Compressive Strength (lbs/ft^2)	324
Unconfined Compressive Strength (psi)	2
Shear Strength (tons/ft^2)	0.1
Shear Strength (lbs/ft^2)	162

GEOCON CONSULTANTS, INC.
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, California 95742
Telephone: (916) 852-9118
Fax: (916) 852-9132

Unconfined Compressive Strength (ASTM D2166)

Project: Gularte #4739
Location:
Number: S1739-05-01
Figure:



Failure Photo



Sample Description	
Sample ID	B3-10.5
Sample Depth (feet)	10.50
Material Description	Very Dark Gray Fat CLAY
Initial Conditions at Start of Test	
Height (inch) average of 3	4.98
Diameter (inch) average of 3	2.40
Moisture Content (%)	32.1
Dry Density (pcf)	89.7
Estimated Specific Gravity	2.7
Saturation (%)	98.0
Shear Test Conditions	
Strain Rate (%/min)	0.9993
Major Principal Stress at Failure (psf)	580
Strain at Failure (%)	1.4
Test Results	
Unconfined Compressive Strength (tons/ft^2)	0.3
Unconfined Compressive Strength (lbs/ft^2)	578
Unconfined Compressive Strength (psi)	4
Shear Strength (tons/ft^2)	0.1
Shear Strength (lbs/ft^2)	289

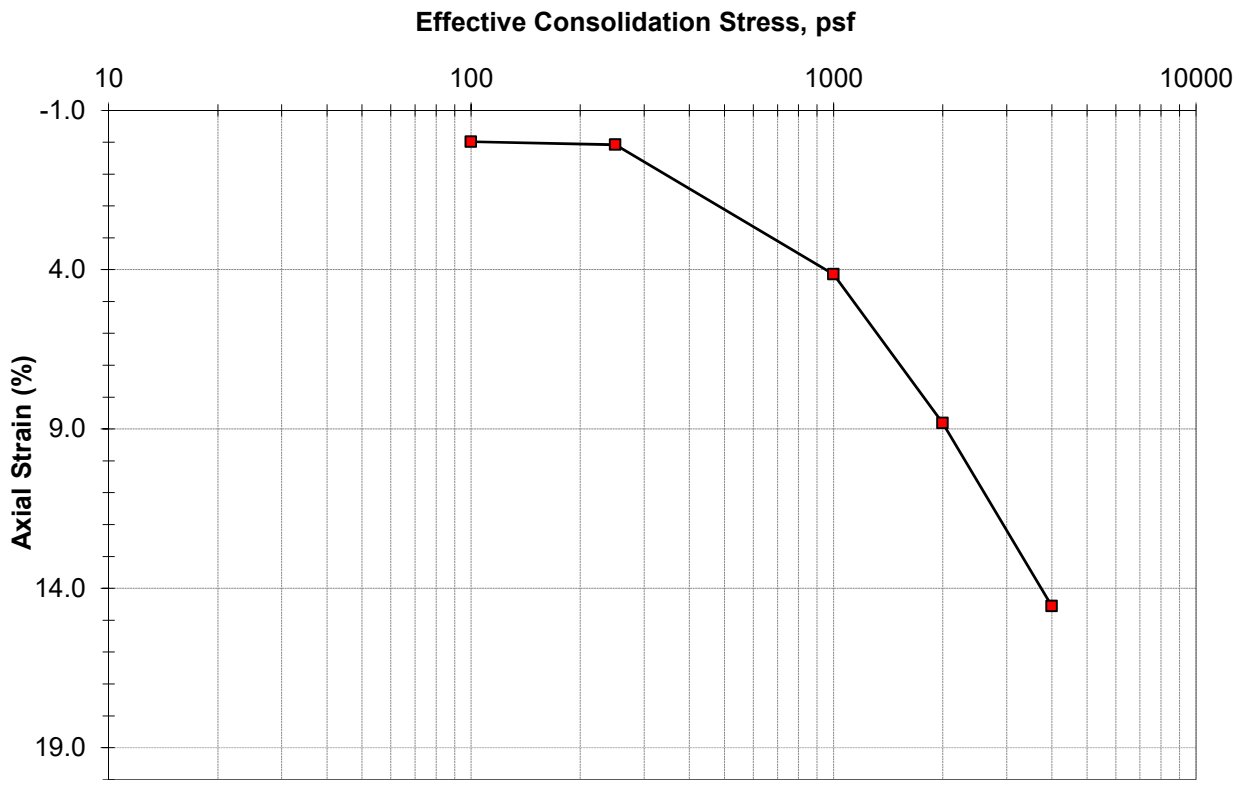
GEOCON CONSULTANTS, INC.
Geocon Consultants, Inc.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, California 95742
Telephone: (916) 852-9118
Fax: (916) 852-9132

Unconfined Compressive Strength (ASTM D2166)

Project: Gularte #4739
Location:
Number: S1739-05-01
Figure:

CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS STRAIN

Project Name	Gularte #4739
Geocon Project Number	S1739-05-01
Boring Number	B-1
Sample Number	10.5-11
Sample Description	Very Dark Gray Fat CLAY



Axial Load, psf	Void Ratio	Axial Strain, %
initial	1.113	0.00
100	1.114	-0.01
250	1.112	0.08
1000	1.026	4.15
2000	0.927	8.81
4000	0.806	14.56

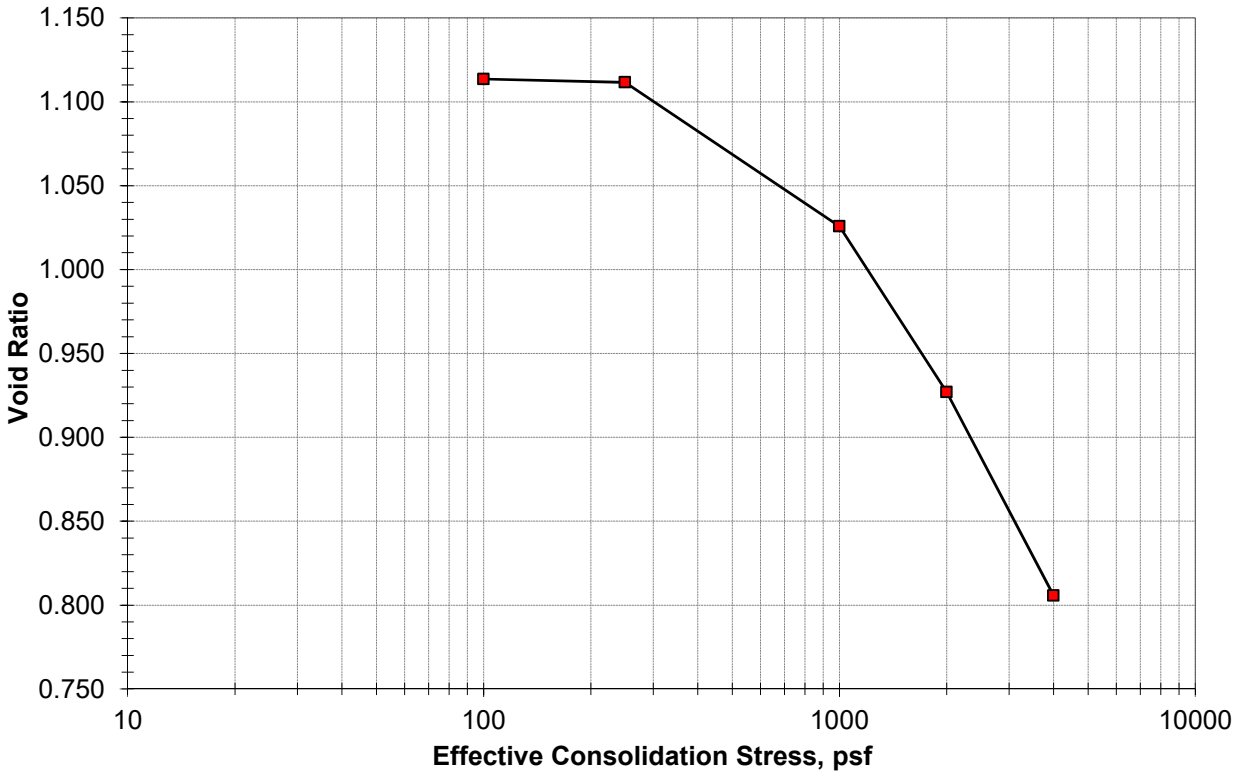
Measurement	Initial	Final
Height (in.)	0.750	0.641
Moisture Content (%)	38.1	29.5
Dry Density (pcf)	80.4	94.1
Saturation (%)	93	100

Note:
Gs = 2.72 (assumed)

GEOCON
CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS VOID RATIO

Project Name	Gularte #4739
Geocon Project Number	S1739-05-01
Boring Number	B-1
Sample Number	10.5-11
Sample Description	Very Dark Gray Fat CLAY



Axial Load, psf	Void Ratio	Axial Strain, %
initial	1.113	0.00
100	1.114	-0.01
250	1.112	0.08
1000	1.026	4.15
2000	0.927	8.81
4000	0.806	14.56

Measurement	Initial	Final
Height (in.)	0.750	0.641
Moisture Content (%)	38.1	29.5
Dry Density (pcf)	80.4	94.1
Saturation (%)	93	100

Note:
Gs = 2.72 (assumed)

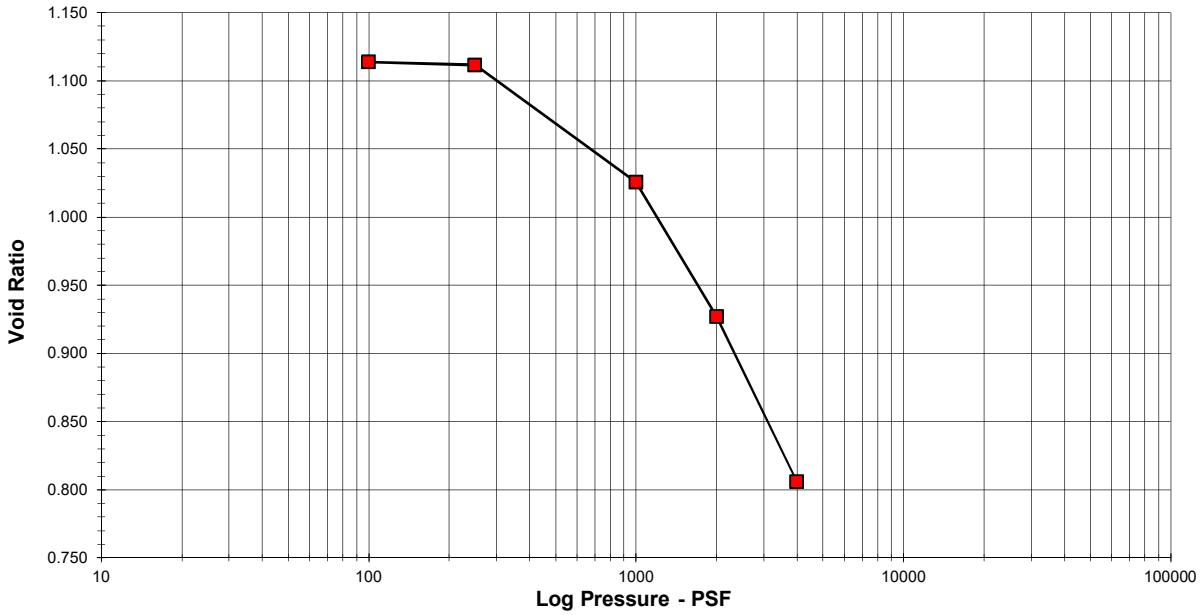
GEOCON
CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

CONSOLIDATION TEST - ASTM D2435

Project Name: Gularte #4739
Project Number: S1739-05-01 Sample Number: B-1 10.5-11

CONSOLIDATION TEST RESULTS

JOB S1739-05-01, BORING B-1, 10.5-11



Axial Load (psf)	Void Ratio	Axial Strain (%)	m_V, coef of vol Compres (in^2/lb)	c_C, Comp Index	50% Consolidation		90% Consolidation	
					t_{50}, Time to Consol (min)	C_V, Coeff of Consol (ft^2/yr)	t_{90}, Time to Consol (min)	C_V, Coeff of Consol (ft^2/yr)
initial	1.113	0.00						
100	1.114	-0.01						
250	1.112	0.08						
1000	1.026	4.15	0.0078	0.143	47.86	2.02	205.05	2.04
2000	0.927	8.81	0.0070	0.328	48.70	1.82	208.66	1.83
4000	0.806	14.56	0.0045	0.403	64.53	1.22	276.50	1.23

G_s = 2.72 (assumed)	COND AT START OF TEST	COND AT END OF TEST
HEIGHT (in.)	0.7500	0.6408
MOISTURE CONTENT (%)	38.1	29.5
DRY DENSITY (pcf):	80.4	94.1
SATURATION (%)	93.1	99.7

GEOCON CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS STRAIN

Project Name	Gularte #4739
Geocon Project Number	S1739-05-01
Boring Number	B1
Sample Number	B1-15-16.5
Sample Description	Greenish gray Fat CLAY, remolded



Axial Load, psf	Void Ratio	Axial Strain, %
initial	0.767	0.00
100	0.767	0.00
250	0.767	-0.02
500	0.767	-0.02
1000	0.759	0.43
2000	0.740	1.51
4000	0.702	3.69

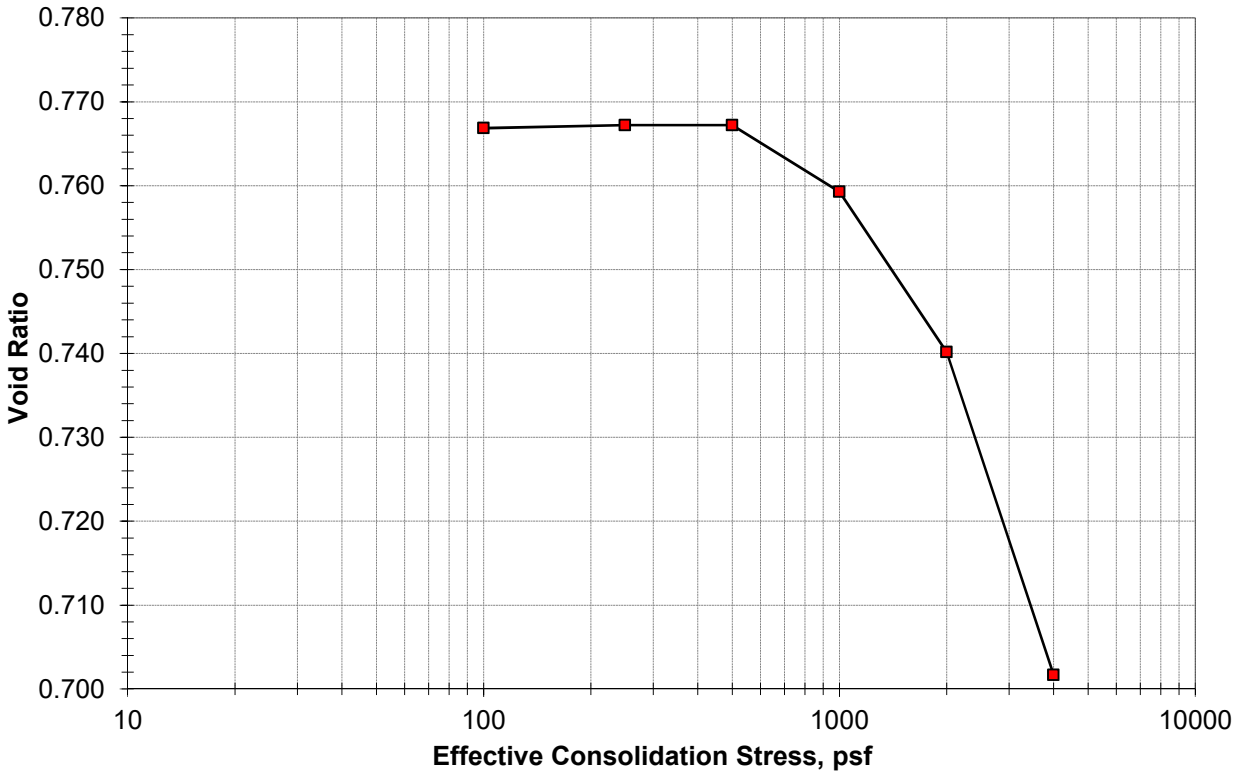
Measurement	Initial	Final
Height (in.)	1.000	0.963
Moisture Content (%)	26.9	25.7
Dry Density (pcf)	96.1	99.8
Saturation (%)	96	100

Note:
Gs = 2.72 (assumed)

GEOCON
CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

CONSOLIDATION TEST - ASTM D2435
STRESS VERSUS VOID RATIO

Project Name	Gularte #4739
Geocon Project Number	S1739-05-01
Boring Number	B1
Sample Number	B1-15-16.5
Sample Description	Greenish gray Fat CLAY, remolded



Axial Load, psf	Void Ratio	Axial Strain, %
initial	0.767	0.00
100	0.767	0.00
250	0.767	-0.02
500	0.767	-0.02
1000	0.759	0.43
2000	0.740	1.51
4000	0.702	3.69

Measurement	Initial	Final
Height (in.)	1.000	0.963
Moisture Content (%)	26.9	25.7
Dry Density (pcf)	96.1	99.8
Saturation (%)	96	100

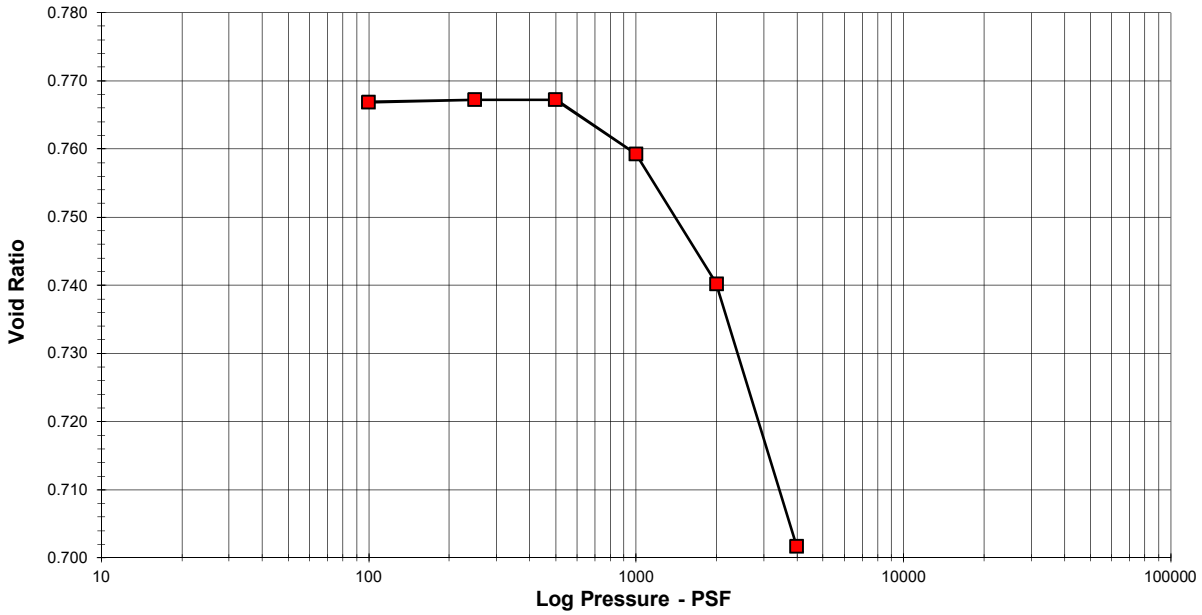
Note:
Gs = 2.72 (assumed)

GEOCON
CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

CONSOLIDATION TEST - ASTM D2435

Project Name: Gularte #4739
Project Number: S1739-05-01 Sample Number: B1 B1-15-16.5

CONSOLIDATION TEST RESULTS
JOB S1739-05-01, BORING B1, B1-15-16.5



Axial Load (psf)	Void Ratio	Axial Strain (%)	m_V, coef of vol Compres (in^2/lb)	c_C, Comp Index	50% Consolidation t_{50}, Time to Consol (min)	50% Consolidation C_V, Coeff of Consol (ft^2/yr)	90% Consolidation t_{90}, Time to Consol (min)	90% Consolidation C_V, Coeff of Consol (ft^2/yr)
initial	0.767	0.00						
100	0.767	0.00						
250	0.767	-0.02						
500	0.767	-0.02						
1000	0.759	0.43	0.0013	0.026	3.07	58.32	13.15	58.65
2000	0.740	1.51	0.0016	0.063	4.56	38.69	19.52	38.91
4000	0.702	3.69	0.0016	0.128	14.47	11.79	62.00	11.85

G_s = 2.72 (assumed)	COND AT START OF TEST	COND AT END OF TEST
HEIGHT (in.)	1.0000	0.9631
MOISTURE CONTENT (%)	26.9	25.7
DRY DENSITY (pcf):	96.1	99.8
SATURATION (%)	95.7	99.6

GEOCON CONSULTANTS, INC.
3160 Gold Valley Drive, Suite 800
Rancho Cordova, CA 95742
tel. 916.852-9118 fax. 916.852.9132

Expansion Index Test; ASTM D4829

Project No.:	4739
Project Name:	731 W Cutting Blvd - Richmon
Date:	10/5/2020
Sampling Location:	B-1 (2'-3')
Sample Description	grayish olive CLAY with silt

Water Content	**No. 1**	
Mass of pan	188.6	grams
Mass of wet soil+pan	435.4	grams
Mass of dry soil+pan	410.2	grams
Water Content (%)	**11.4**	percent

Dry Soil Density		
Weight of Ring	199.0	grams
Weight of Ring + Soil	579.2	grams
Height of Ring	1	inches
Ring Diamenter	4	inches
Volume of Ring	12.6	in^3
Wet Soil Density	115.0	pcf
Dry Soil Density	**103.3**	**pcf**

Saturation and Expansion Index	
Percent Saturation	48.6
Uncorrected EI	62.4
Corrected EI	**61.4**

	Dial Readings	
	Time (hrs)	Reading (in)
9-Oct	14:09	0.0000
	14:14	0.0019
12-Oct	17:15	0.0624

Delta	0.0624

EI	Classification
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
> 130	Very High

Notes:

ASTM D2216/2922 Moisture/Density Test

Project No.: 4739
Project Name: 731 W Cutting Blvd - Richmond
Sampling Locations: See Site Plan

Soil Description: See Boring Logs

Boring Location	**B-1**	**B-4**	**B-1**	**B-3**	**B-2**	**B-4**
Sample Depth	3.5'-4'	6'-6.5'	11'-11.5'	11'-11.5'	16'-16.5'	16'-16.5'

Water Content Calculations	**No. 1**	**No. 2**	**No. 3**	**No. 4**	**No. 5**	**No. 6**
Obtain Mass of Container	182.6	190.8	191.6	188.6	187.4	192.0
n Mass of Wet Specimen+Container	1041.8	917.8	1060.2	1047.4	1151.4	1140.2
in Mass of Dry Specimen+Container	872.6	672.8	905.0	901.4	1037.2	1041.6
Water Content (%)	**24.5**	**50.8**	**21.8**	**20.5**	**13.4**	**11.6**

Soil Density Calculations	**No. 1**	**No. 2**	**No. 3**	**No. 4**	**No. 5**	**No. 6**
Obtain Mass of Mold:	282.6	254.6	281.6	277.8	282.2	270.4
Obtain Mass of Soil and Mold:	1146.4	984.8	1149.4	1136.4	1249.0	1218.6
Total Mass of Soil	863.8	730.2	867.8	858.6	966.8	948.2
Length of sample	6.0	5.8	6.0	6.0	6.0	5.6
Wet Soil Density	119.0	104.1	119.6	118.3	133.2	141.3
Dry Soil Density	**95.6**	**69.0**	**98.2**	**98.2**	**117.5**	**126.6**

Notes

ASTM D1140 Sieve Wash Over The No. 200 Screen

Project No.: 4739
Project Name: 731 W Cutting Blvd - Richmond
Date: 10/8/20

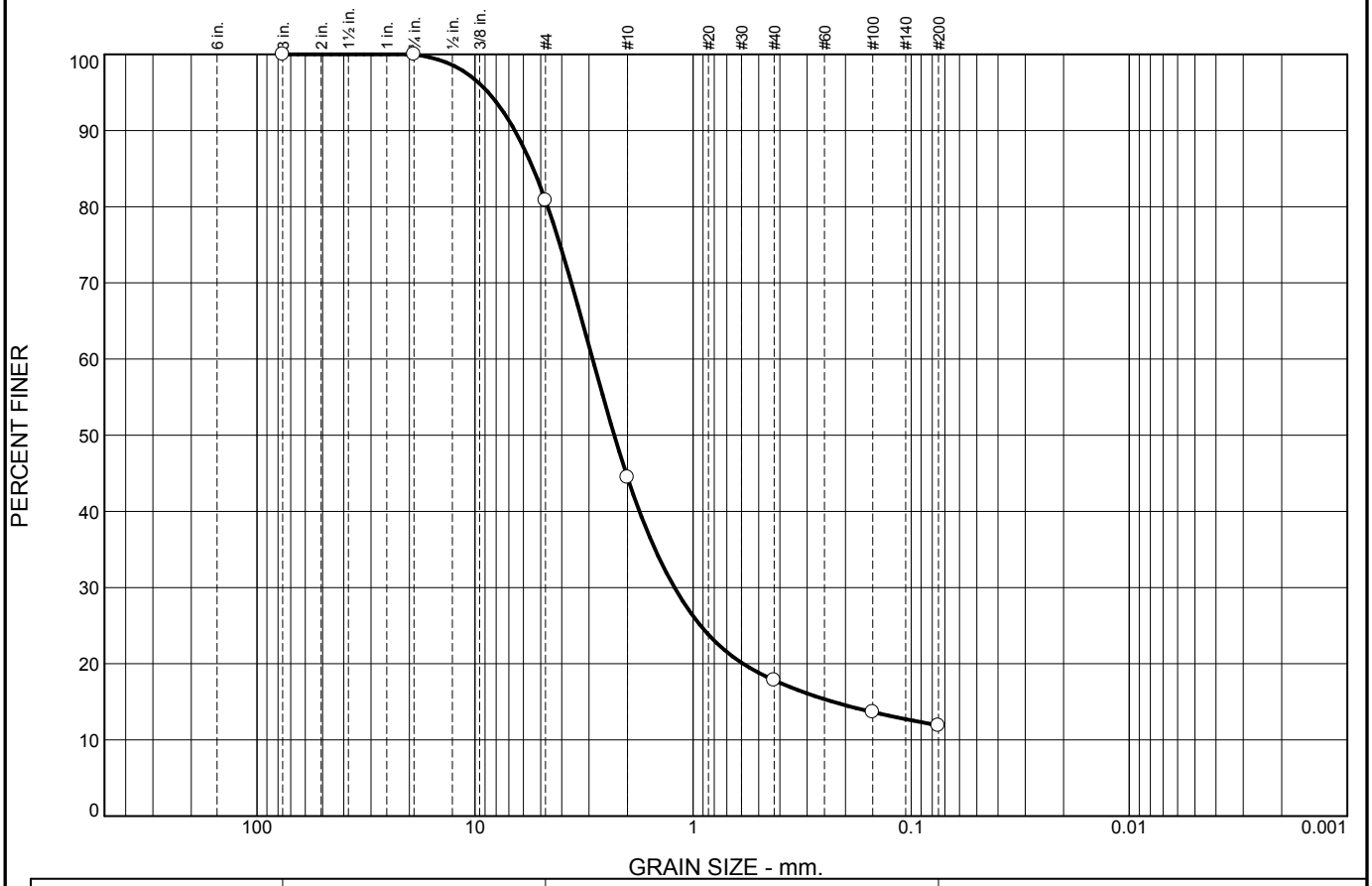
Soil Description: See Logs

Basic Information

Procedure Used (A or B): A
Preparation Method Used (Wet or Dry): Wet

Boring #	**B-1**	**B-4**	**B-1**	**B-4**	**B-2**	**B-3**
Depth	5'-6.5'	10.8'-11.5'	15'-15.5'	16'-17.7'	17'-18.3'	22'-22.8'
Pan #	34	11	15	80	47	8
Mass of Container	192.0	194.0	192.6	190.6	190.0	195.6
Mass of Dry Specimen+Container	225.8	238.4	243.0	480.0	338.0	244.2
Mass of Dry Washed+Container	192.2	202.4	222.8	462.0	320.4	217.0
Percent Passing No. 200 Sieve	**99.4**	**81.1**	**40.1**	**6.2**	**11.9**	**56.0**
Mass of Container+Wet Specimen	245.4	251.0	253.0	507.8	360.6	255.6
Mass of Container+Dry Specimen	225.8	238.4	243.0	480.0	338.0	244.2
Water Content %	**58.0**	**28.4**	**19.8**	**9.6**	**15.3**	**23.5**

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	19.2	36.3	26.7	5.9	11.9

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			5.4115	2.8886	2.2987	1.2164	0.2278			

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ gray Well Graded SAND with silt and gravel	10/5/2020	SW-SM	

Project No. 4739 **Client:** Duke Realty

Project: 731 W Cutting Blvd - Richmond

○ **Location:** B-2 (17'-18.3') **Sample Number:** 2.5

GULARTE & ASSOCIATES, INC.

Rocklin, CA

Remarks:

Figure

Tested By: JZ

Particle Size Distribution Report



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	28.3	23.3	27.9	14.3	6.2

	LL	PL	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
○			7.9933	3.1180	2.1367	0.7896	0.2879	0.1873	1.07	16.65

MATERIAL DESCRIPTION	TEST DATE	USCS	NM
○ gray Well Graded SAND with silt and gravel	10/5/2020	SW-SM	

Project No. 4739 **Client:** Duke Realty

Project: 731 W Cutting Blvd - Richmond

○ **Location:** B-4 (16.5'-17.7') **Sample Number:** 4.5

GULARTE & ASSOCIATES, INC.

Rocklin, CA

Remarks:

Figure

Tested By: JZ

APPENDIX C

Historical Aerial Photographs

731 W Cutting Blvd

731 W Cutting Blvd

Richmond, CA 94804

Inquiry Number: 6219135.1

October 07, 2020

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

10/07/20

Site Name:

731 W Cutting Blvd
731 W Cutting Blvd
Richmond, CA 94804
EDR Inquiry # 6219135.1

Client Name:

Gularte & Associates, Inc.
1049 Nichols Court
Rocklin, CA 95765
Contact: Jay Zlotkowski

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	*Scale*	*Details*	*Source*
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
1998	1"=500'	Flight Date: August 29, 1998	USDA
1993	1"=500'	Acquisition Date: July 10, 1993	USGS/DOQQ
1982	1"=500'	Flight Date: August 16, 1982	USDA
1974	1"=500'	Flight Date: October 14, 1974	USGS
1968	1"=500'	Flight Date: April 20, 1968	USGS
1963	1"=500'	Flight Date: June 24, 1963	EDR Proprietary Aerial Viewpoint
1958	1"=500'	Flight Date: July 22, 1958	USGS
1946	1"=500'	Flight Date: July 22, 1946	USGS
1939	1"=500'	Flight Date: August 04, 1939	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.

Disclaimer - Copyright and Trademark Notice

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OF DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT. Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction or forecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

Copyright 2020 by Environmental Data Resources, Inc. All rights reserved. Reproduction in any media or format, in whole or in part, of any report or map of Environmental Data Resources, Inc., or its affiliates, is prohibited without prior written permission.

EDR and its logos (including Sanborn and Sanborn Map) are trademarks of Environmental Data Resources, Inc. or its affiliates. All other trademarks used herein are the property of their respective owners.


INQUIRY #: 6219135.1
YEAR: 2016
= 500'
N
EDR


INQUIRY #: 6219135.1
YEAR: 2012
= 500'
N
EDR


INQUIRY #: 6219135.1
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 6219135.1
YEAR: 2005
= 500'
N
EDR



INQUIRY #: 6219135.1

YEAR: 1998

= 500'

N

EDR


INQUIRY #: 6219135.1
YEAR: 1993
= 500'
N
EDR



INQUIRY #: 6219135.1

YEAR: 1982

= 500'

N

EDR


INQUIRY #: 6219135.1
YEAR: 1974
= 500'
N
EDR



INQUIRY #: 6219135.1

YEAR: 1968

= 500'

N

EDR


INQUIRY #: 6219135.1
YEAR: 1963
= 500'
N
EDR



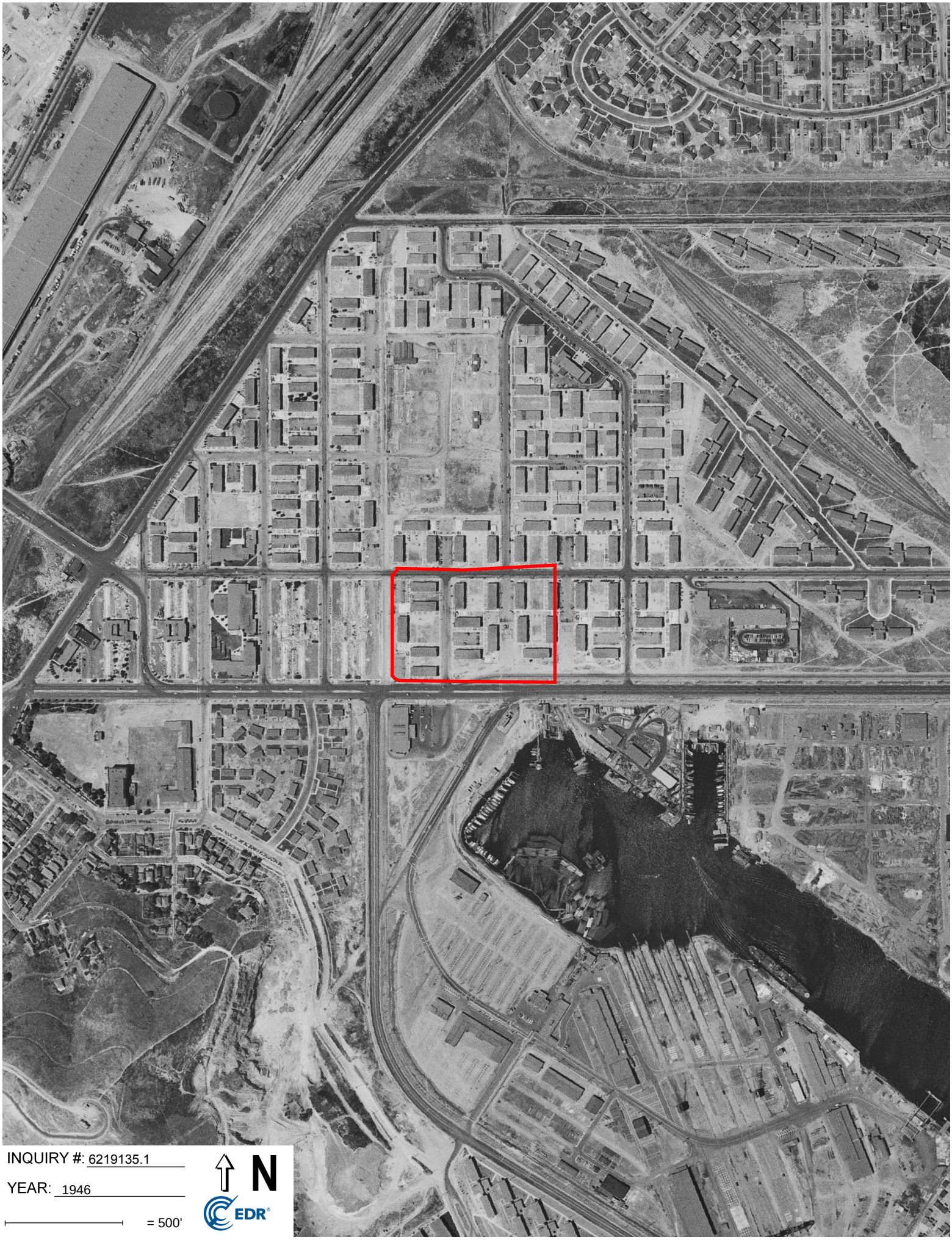
INQUIRY #: 6219135.1

YEAR: 1958

= 500'

N

EDR



INQUIRY #: 6219135.1

YEAR: 1946

= 500'

N

EDR



INQUIRY #: 6219135.1

YEAR: 1939

= 500'

N

EDR

APPENDIX D

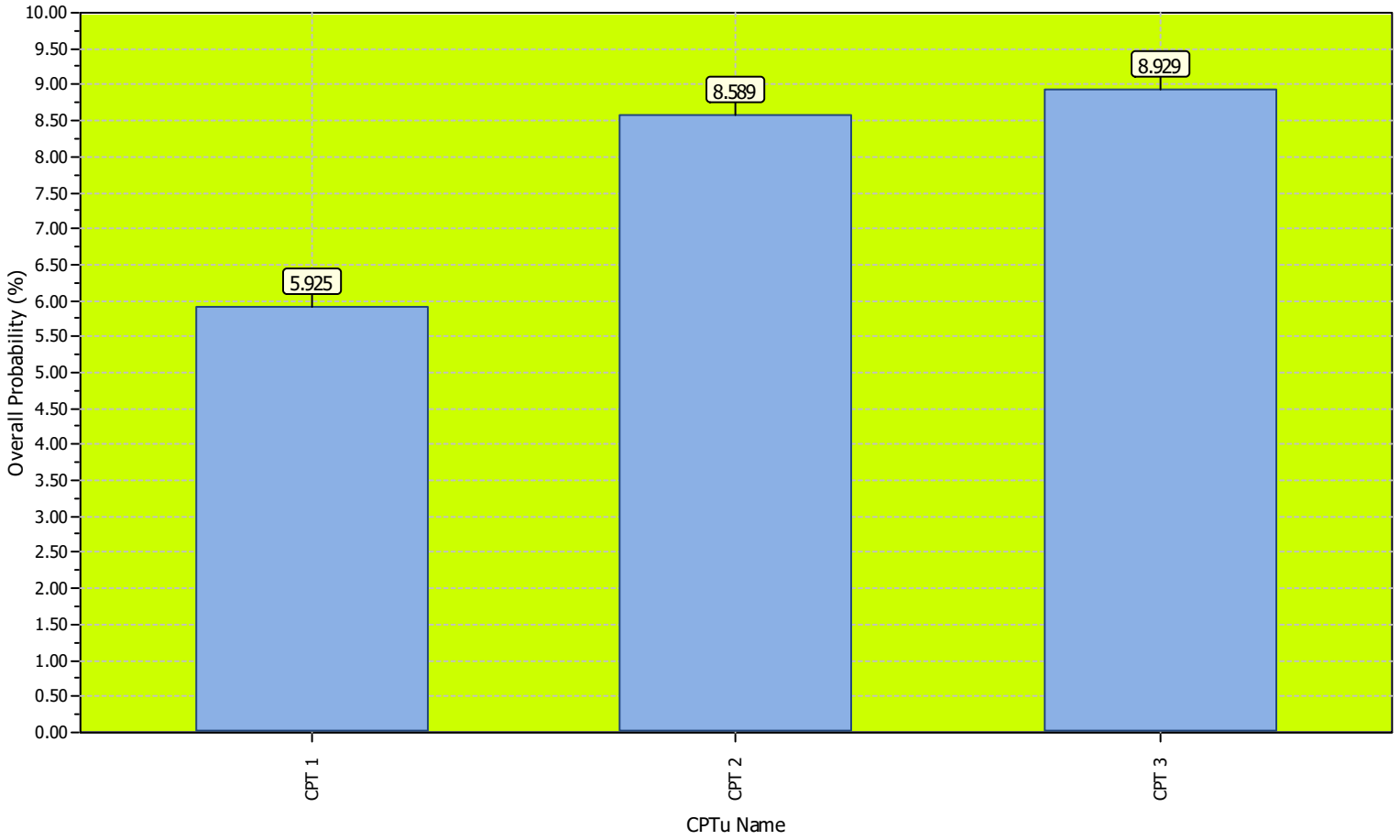
CLiq Software Output

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

Project title :

Location :

Overall Probability for Liquefaction report



Probability color scheme

- Very High Probability
- High Probability
- Low Probability

Basic statistics

Total CPT number: 3
100% low probability
0% high probability
0% very high probability

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

Project title :

Location :

Overall vertical settlements report

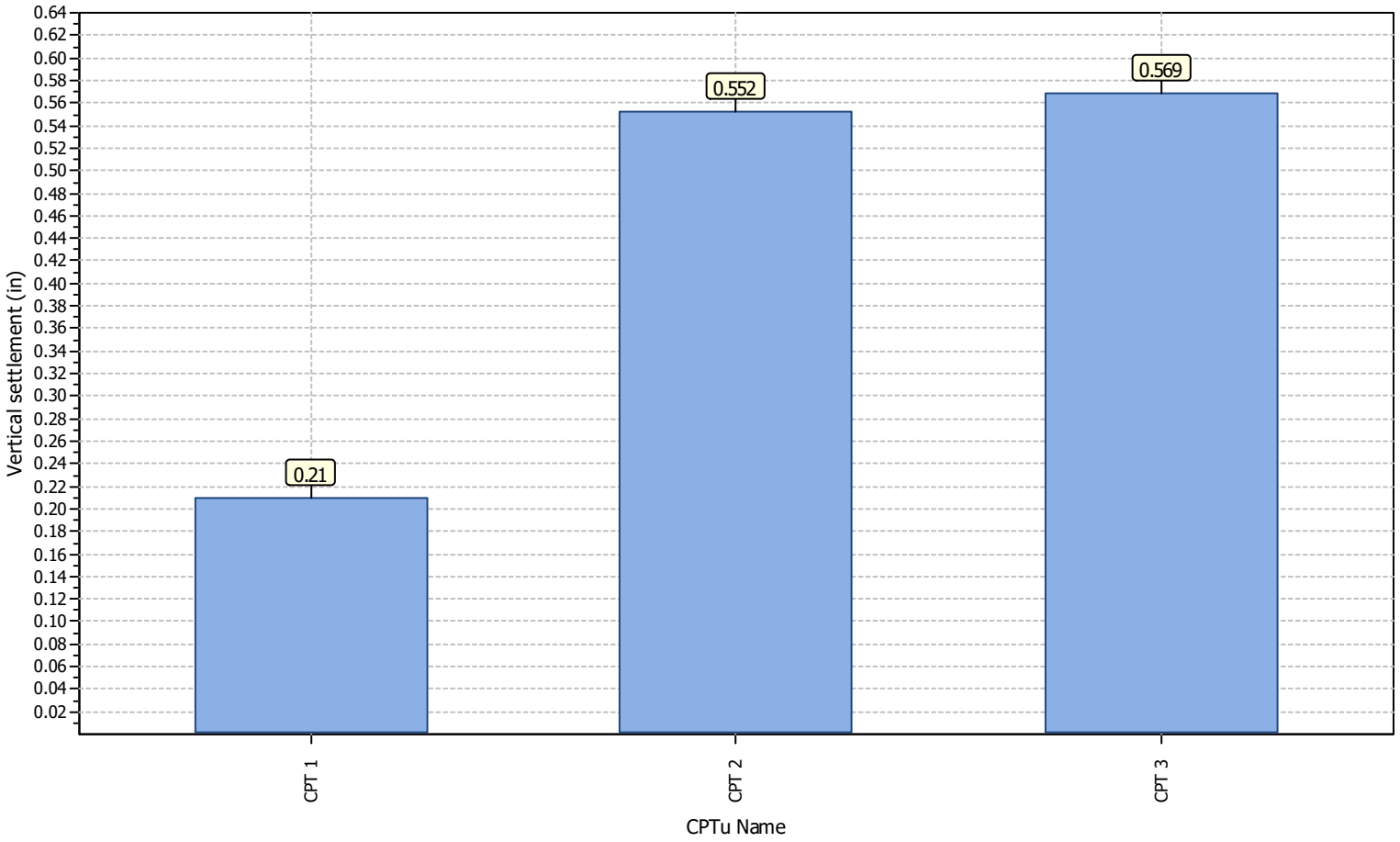


TABLE OF CONTENTS

CPT 1 results

Summary data report 1
Transition layer aglorithm summary report 8
Transition layer aglorithm data report 9
Input field data 10
Cyclic stress resistance results 17
Cyclic resistance ratio results 24
Liquefaction potential index data 31
Vertical settlements summary report 35
Vertical settlements data report 36
Lateral displacements summary report 39
Lateral displacements data report 40

CPT 2 results

Summary data report 46
Transition layer aglorithm summary report 53
Transition layer aglorithm data report 54
Input field data 55
Cyclic stress resistance results 62
Cyclic resistance ratio results 69
Liquefaction potential index data 76
Vertical settlements summary report 80
Vertical settlements data report 81
Lateral displacements summary report 84
Lateral displacements data report 85

CPT 3 results

Summary data report 91
Transition layer aglorithm summary report 98
Transition layer aglorithm data report 99
Input field data 100
Cyclic stress resistance results 106
Cyclic resistance ratio results 113
Liquefaction potential index data 120
Vertical settlements summary report 124
Vertical settlements data report 125
Lateral displacements summary report 128
Lateral displacements data report 129
Strength loss data report 134

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

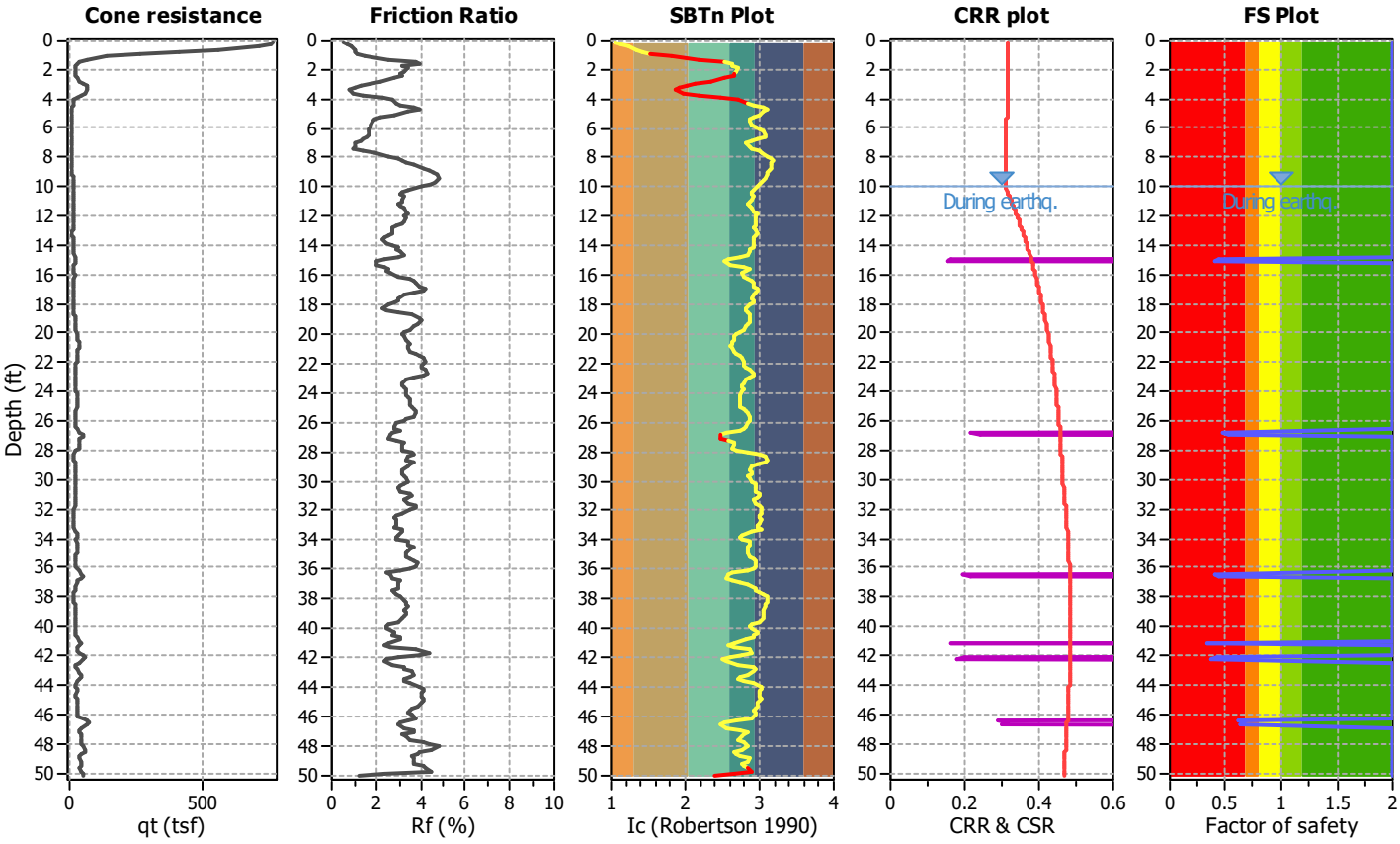
LIQUEFACTION ANALYSIS REPORT

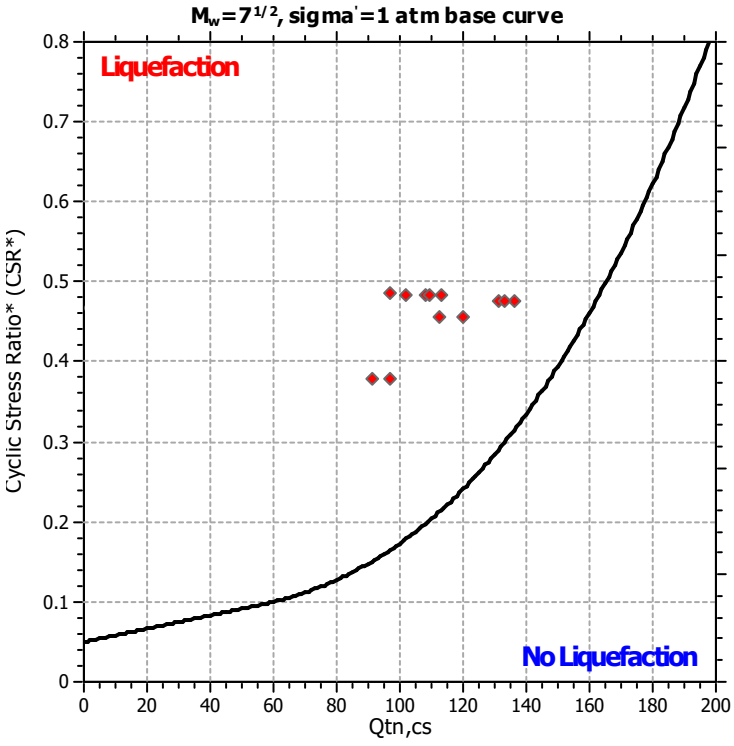
Project title : **Location :**

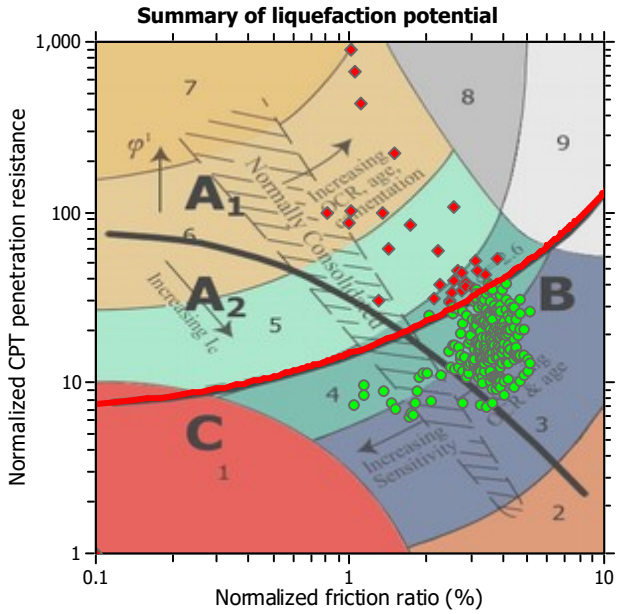
CPT file : CPT 1

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.56	Unit weight calculation:	Based on SBT	K_o applied:	Yes		

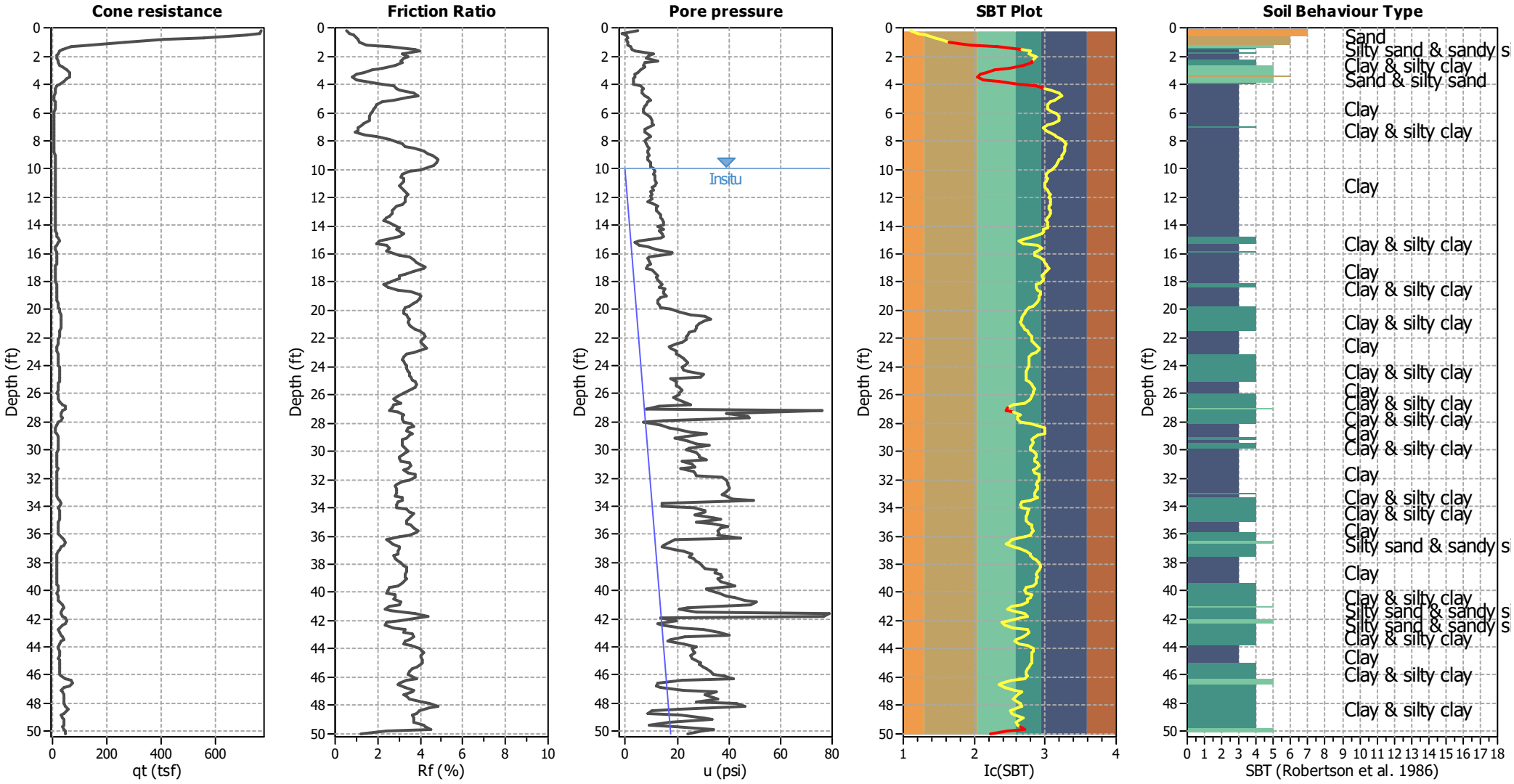






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



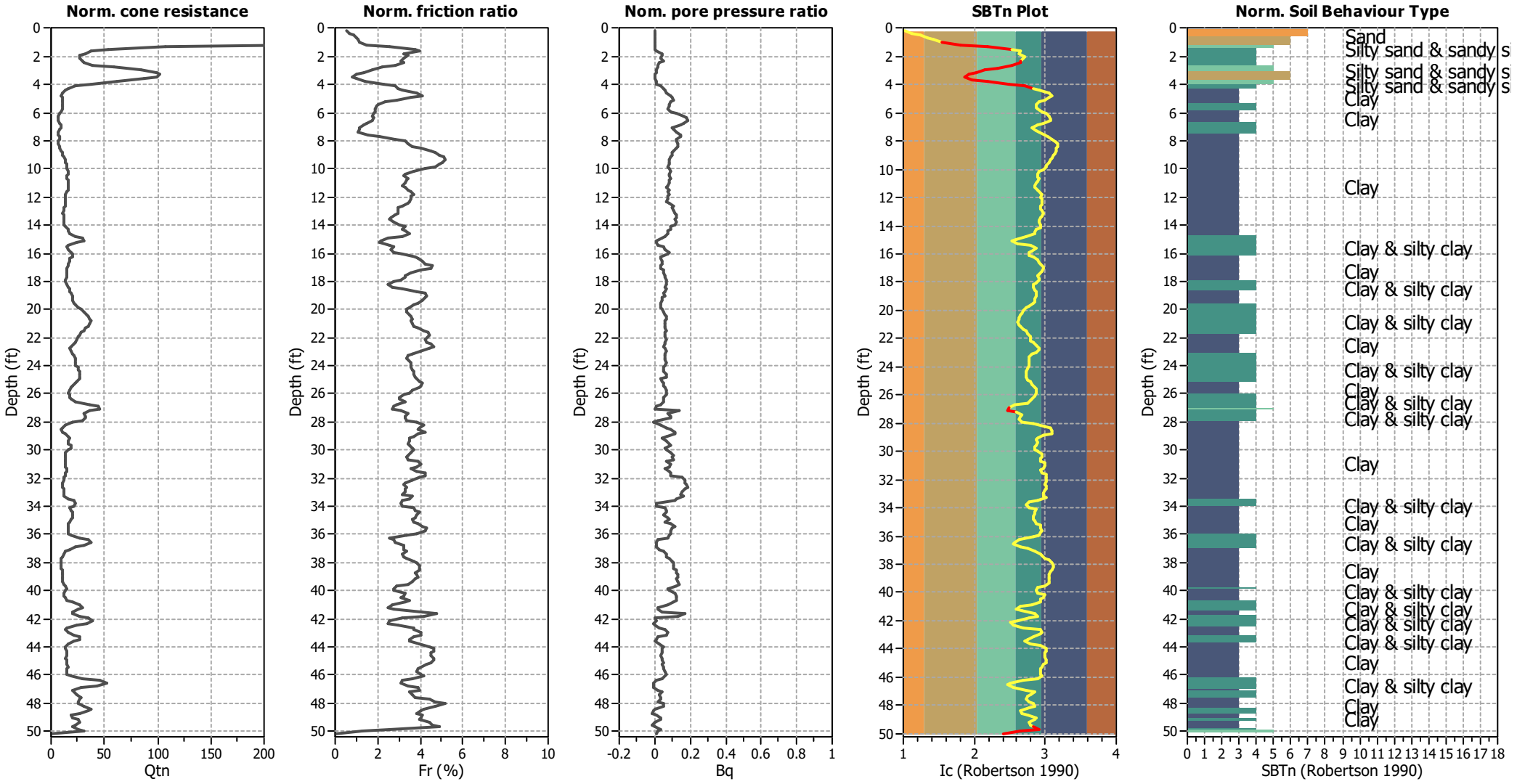
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



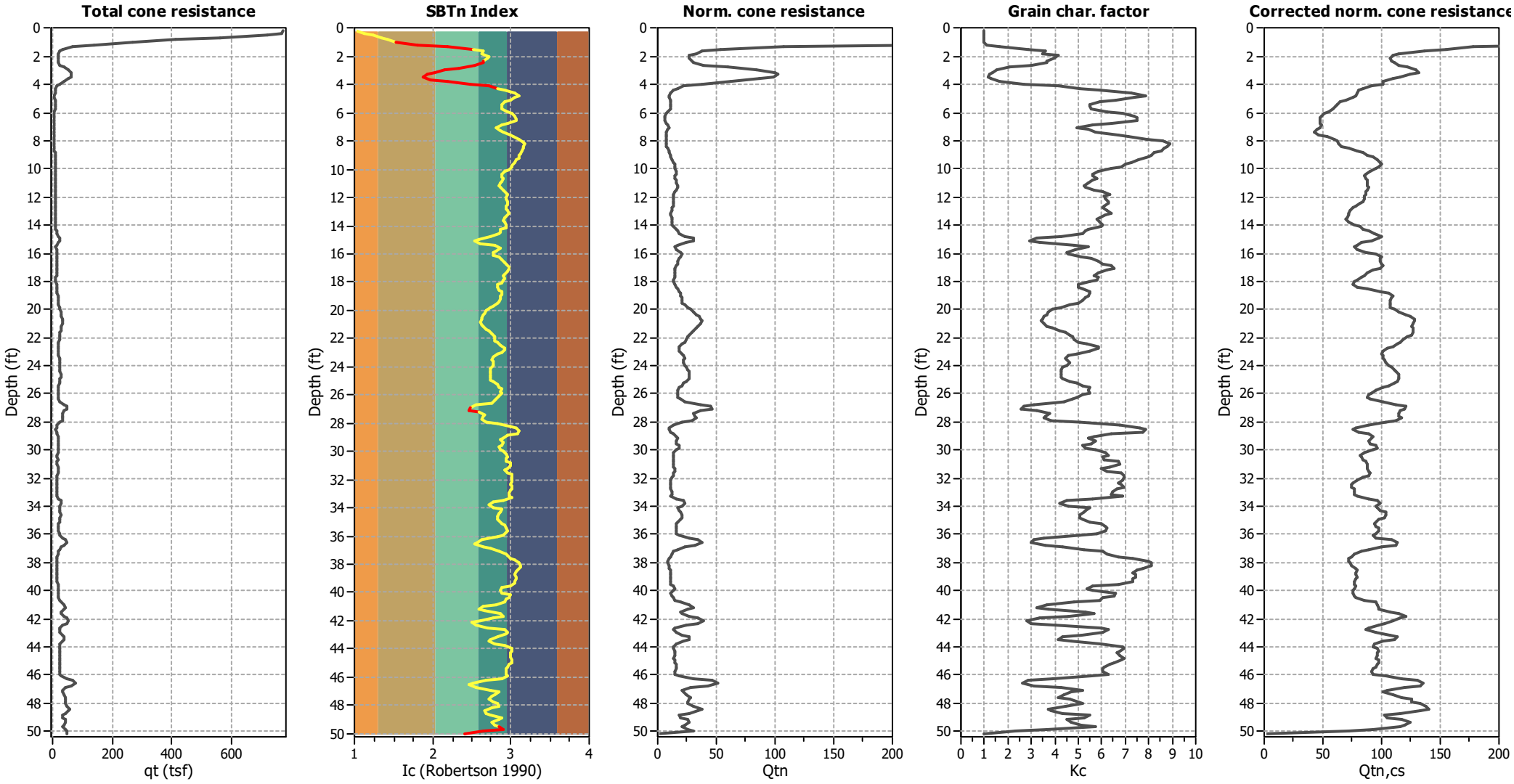
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

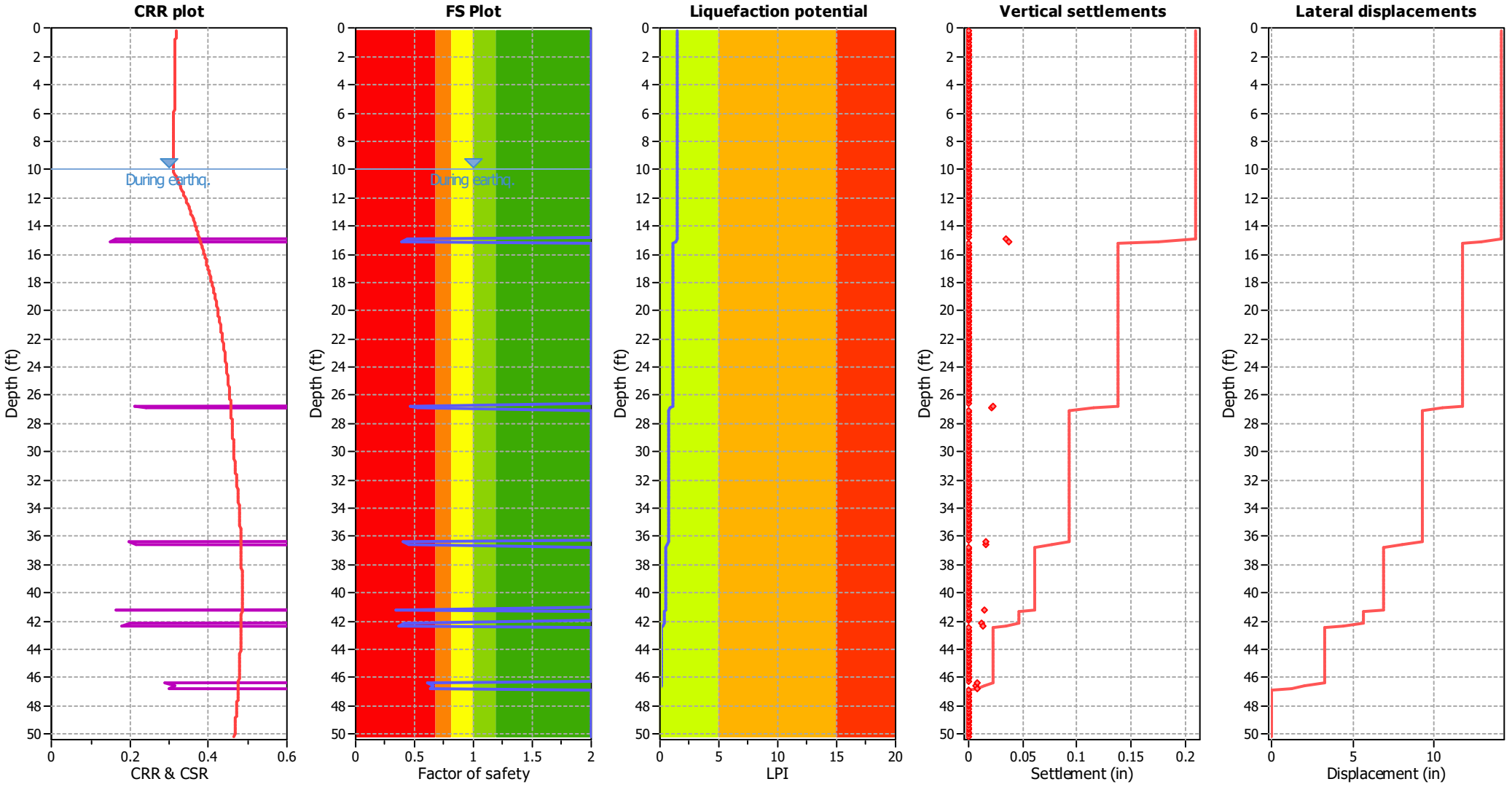
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

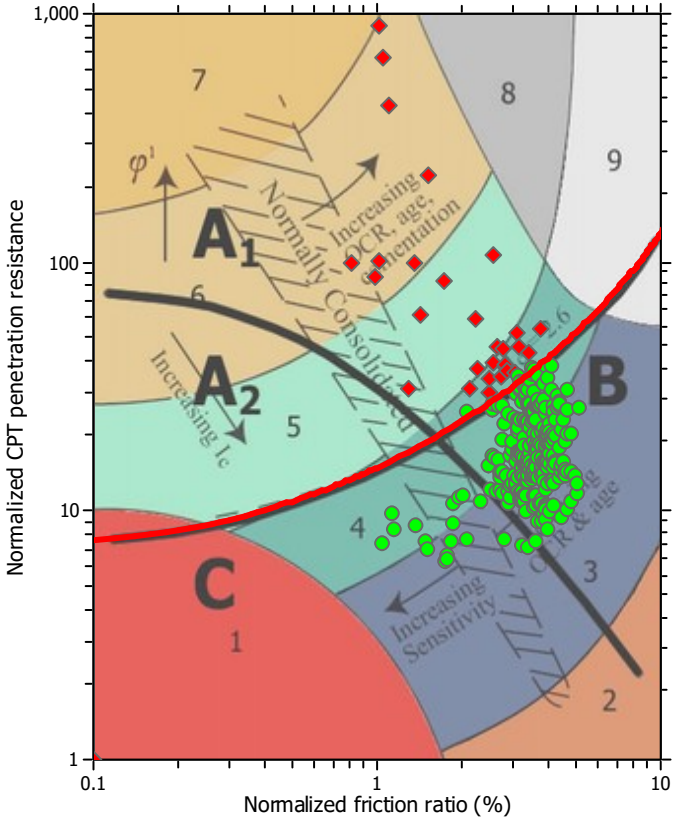
F.S. color scheme

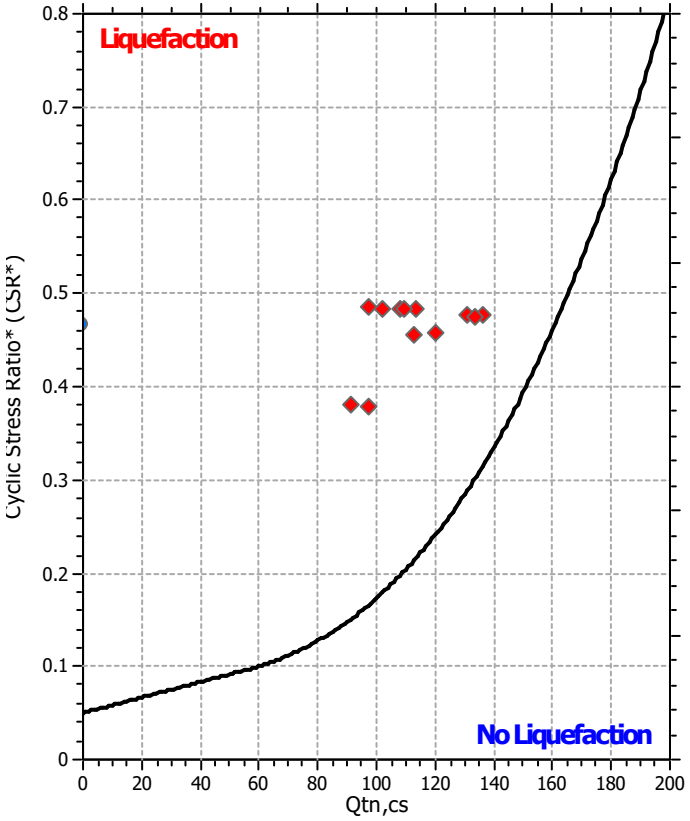
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

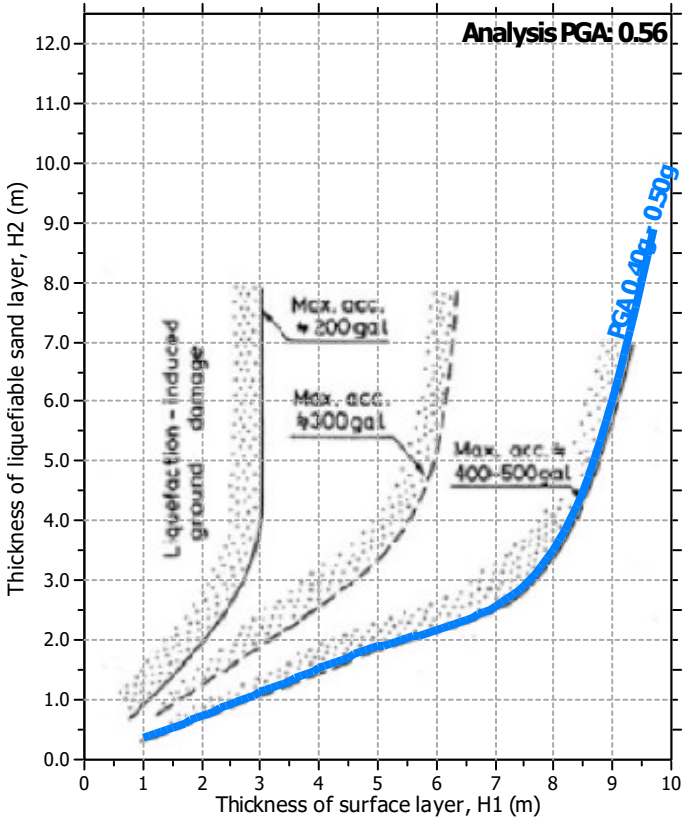
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



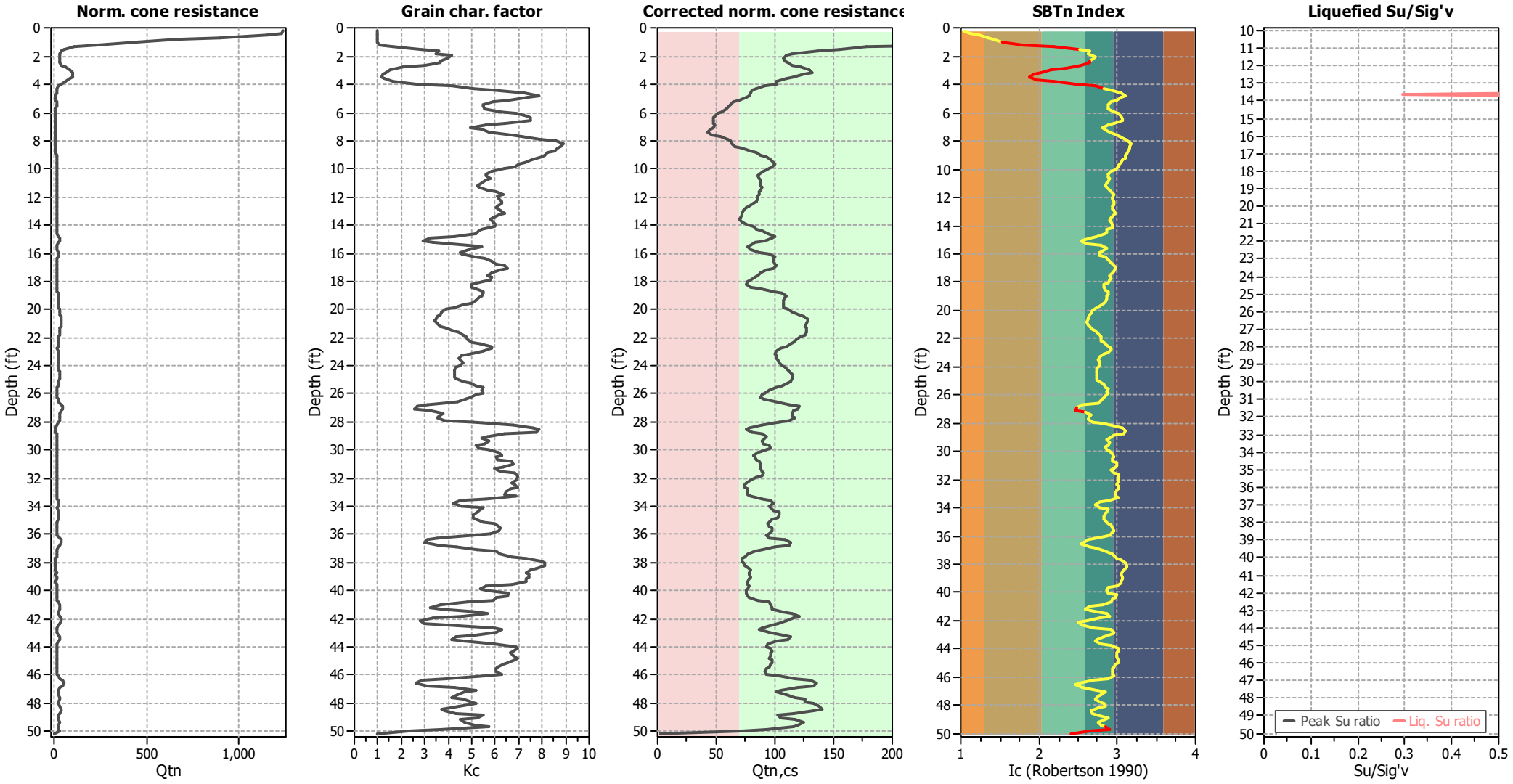




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

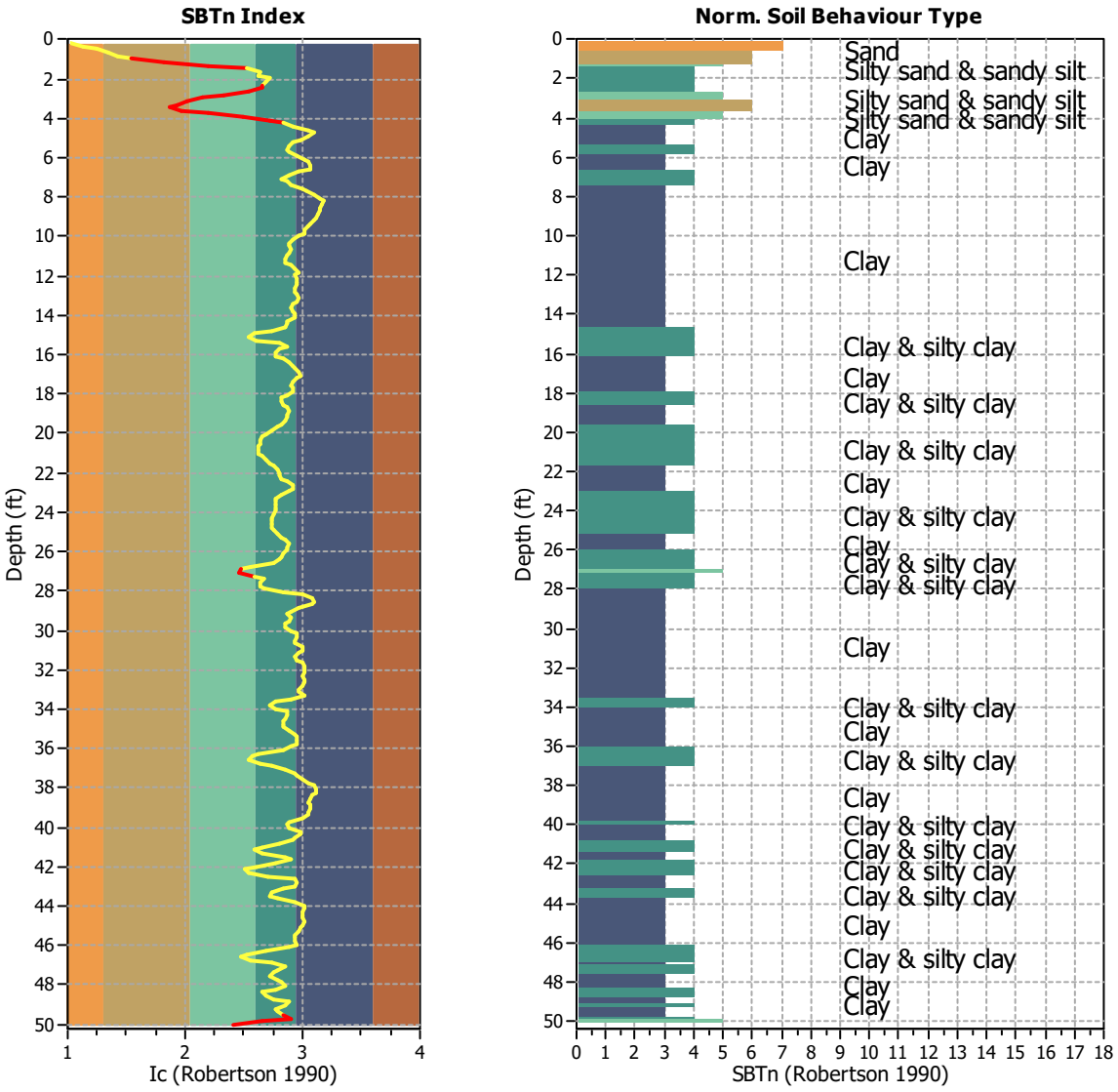
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0200
Minimum number of points in layer:	3

General statistics

Total points in CPT file:	306
Total points excluded:	24
Exclusion percentage:	7.84%
Number of layers detected:	5

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 1	4	Start depth: 1.15 (ft)	6	Sand & silty sand
		End depth: 1.64 (ft)	4	Clay & silty clay
Transition layer 2	7	Start depth: 2.46 (ft)	4	Clay & silty clay
		End depth: 3.45 (ft)	6	Sand & silty sand
Transition layer 3	7	Start depth: 3.45 (ft)	6	Sand & silty sand
		End depth: 4.43 (ft)	3	Clay
Transition layer 4	3	Start depth: 27.07 (ft)	5	Silty sand & sandy silt
		End depth: 27.40 (ft)	4	Clay & silty clay
Transition layer 5	3	Start depth: 49.71 (ft)	3	Clay
		End depth: 50.03 (ft)	5	Silty sand & sandy silt

Start depth: Depth where the transition layer begins
End depth: Depth where the transition layer ends

:: Field input data ::

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1	0.16	702.52	2.91	4.97	0.00	136.44
2	0.33	910.62	5.87	-1.34	0.00	137.28
3	0.49	690.41	6.53	0.07	0.00	137.28
4	0.66	553.79	6.17	0.76	0.93	137.28
5	0.82	437.94	4.31	0.21	1.79	135.66
6	0.98	241.34	2.48	1.09	3.36	131.89
7	1.15	126.03	2.13	0.94	8.41	127.69
8	1.31	48.20	1.65	1.74	18.78	124.49
9	1.48	26.74	1.37	2.42	31.60	120.57
10	1.64	25.81	0.78	3.92	37.54	117.47
11	1.80	18.13	0.65	11.01	36.64	114.54
12	1.97	17.42	0.54	9.36	41.39	113.03
13	2.13	14.01	0.53	8.11	40.08	112.76
14	2.30	19.15	0.58	12.31	38.11	113.27
15	2.46	21.76	0.61	7.30	37.91	113.78
16	2.63	15.91	0.63	6.79	32.38	115.32
17	2.79	35.08	0.83	7.78	23.67	117.69
18	2.95	60.15	1.02	5.93	17.18	119.22
19	3.12	62.21	0.87	4.92	13.42	119.01
20	3.28	63.60	0.61	3.80	11.07	117.16
21	3.45	64.85	0.44	3.71	9.80	115.27
22	3.61	57.59	0.45	3.27	12.25	115.36
23	3.77	39.87	0.70	2.98	18.68	114.82
24	3.94	18.49	0.51	2.93	30.00	113.35
25	4.10	12.37	0.39	5.82	41.58	109.78
26	4.27	11.07	0.27	6.76	47.98	107.40
27	4.43	8.15	0.26	6.36	53.31	105.85
28	4.59	6.62	0.26	6.25	61.57	105.23
29	4.76	6.26	0.26	7.61	65.28	104.81
30	4.92	6.24	0.24	8.67	62.28	104.04
31	5.09	7.01	0.18	9.88	57.63	102.90
32	5.25	7.08	0.15	8.65	53.43	101.55
33	5.41	6.86	0.14	8.13	50.59	100.93
34	5.58	7.86	0.14	7.53	50.52	100.52
35	5.74	6.75	0.13	6.86	51.09	99.70
36	5.91	5.84	0.11	7.12	55.41	97.90
37	6.07	4.55	0.07	7.72	59.30	96.16
38	6.23	4.21	0.08	9.42	62.10	94.70
39	6.40	4.17	0.07	9.87	63.09	94.40
40	6.56	4.12	0.07	10.18	63.04	94.11
41	6.73	4.08	0.07	10.35	56.23	94.61
42	6.89	6.41	0.07	10.81	51.35	95.57
43	7.05	6.56	0.09	8.49	46.88	95.20
44	7.22	5.84	0.05	7.68	50.20	93.86
45	7.38	4.09	0.04	7.76	52.32	91.96
46	7.55	4.65	0.05	9.01	58.16	94.24
47	7.71	5.23	0.11	9.75	60.74	97.40
48	7.87	5.23	0.14	8.12	65.57	99.51

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
49	8.04	4.65	0.15	7.64	69.41	100.17
50	8.20	4.65	0.15	7.92	70.96	100.36
51	8.37	4.97	0.16	8.37	70.35	101.34
52	8.53	5.47	0.21	8.91	69.57	103.11
53	8.69	6.20	0.27	8.78	68.87	104.86
54	8.86	6.69	0.30	8.49	67.40	106.05
55	9.02	7.13	0.32	9.16	66.39	107.04
56	9.19	7.63	0.37	8.73	65.73	107.91
57	9.35	7.95	0.41	8.76	63.44	108.94
58	9.51	9.44	0.44	9.55	61.54	109.49
59	9.68	9.34	0.44	9.63	59.92	109.66
60	9.84	9.08	0.42	9.62	59.17	109.40
61	10.01	9.49	0.40	10.79	56.58	108.93
62	10.17	10.16	0.35	11.58	52.94	108.31
63	10.34	10.44	0.31	10.85	51.25	107.59
64	10.50	9.55	0.30	11.31	51.30	107.28
65	10.66	9.69	0.32	11.44	52.53	107.53
66	10.83	10.01	0.34	11.33	51.57	107.77
67	10.99	10.56	0.32	11.83	50.22	108.07
68	11.16	11.13	0.34	11.46	49.04	108.00
69	11.32	10.79	0.33	10.53	49.57	108.18
70	11.48	10.49	0.34	11.07	51.90	107.85
71	11.65	9.02	0.32	9.48	54.13	107.51
72	11.81	8.90	0.30	10.37	55.91	107.15
73	11.98	8.99	0.31	9.97	54.57	107.08
74	12.14	9.71	0.30	10.21	54.94	107.05
75	12.30	8.70	0.30	8.64	55.58	106.62
76	12.47	8.08	0.27	10.42	55.47	106.14
77	12.63	9.14	0.25	12.61	54.34	105.46
78	12.80	8.45	0.23	11.92	54.03	104.87
79	12.96	7.54	0.22	12.07	55.38	104.14
80	13.12	7.62	0.20	12.84	56.40	103.79
81	13.29	7.57	0.21	13.51	54.95	103.59
82	13.45	8.05	0.20	13.89	53.51	103.49
83	13.62	8.36	0.19	14.04	52.51	103.39
84	13.78	8.09	0.19	14.82	53.41	104.11
85	13.94	8.42	0.25	15.00	54.04	105.32
86	14.11	9.56	0.29	12.51	53.89	106.68
87	14.27	10.04	0.32	14.75	50.10	107.78
88	14.44	12.85	0.35	13.11	49.60	108.76
89	14.60	11.68	0.40	14.32	48.71	110.09
90	14.76	13.36	0.50	14.94	42.58	112.09
91	14.93	24.18	0.60	13.49	34.71	113.08
92	15.09	27.67	0.47	5.38	32.25	112.40
93	15.26	16.52	0.34	3.66	35.56	109.94
94	15.42	10.60	0.28	5.38	46.02	107.39
95	15.58	9.28	0.26	8.76	50.17	106.46
96	15.75	11.59	0.27	11.88	46.53	107.43

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
97	15.91	15.06	0.35	17.96	44.02	109.63
98	16.08	16.01	0.51	17.36	44.66	111.34
99	16.24	14.84	0.54	9.45	48.41	111.93
100	16.40	12.52	0.50	8.38	51.06	111.43
101	16.57	12.59	0.45	9.39	52.99	111.15
102	16.73	12.70	0.51	9.59	54.09	111.30
103	16.90	11.99	0.53	8.48	56.26	111.37
104	17.06	11.14	0.48	8.32	57.32	110.90
105	17.22	11.20	0.43	10.39	55.41	110.01
106	17.39	11.91	0.37	11.24	53.08	109.32
107	17.55	11.78	0.36	12.39	51.89	108.73
108	17.72	11.23	0.34	11.92	52.94	108.27
109	17.88	10.44	0.32	12.27	52.69	107.55
110	18.05	10.91	0.27	12.99	50.50	106.98
111	18.21	12.08	0.26	13.94	47.35	107.07
112	18.37	13.29	0.30	13.04	47.37	108.30
113	18.54	13.16	0.40	15.09	48.50	110.20
114	18.70	14.77	0.52	14.94	50.53	112.14
115	18.87	15.49	0.65	14.61	50.78	113.43
116	19.03	16.00	0.67	15.65	50.27	114.09
117	19.19	17.11	0.67	13.87	49.64	114.10
118	19.36	16.42	0.64	12.62	48.75	114.10
119	19.52	17.22	0.65	12.38	47.49	114.17
120	19.69	19.01	0.66	13.06	44.93	114.55
121	19.85	21.10	0.69	13.67	42.25	115.13
122	20.01	23.24	0.75	17.65	39.85	116.03
123	20.18	26.52	0.85	20.96	38.46	117.00
124	20.34	27.83	0.94	25.38	37.72	117.98
125	20.51	29.22	1.04	30.70	37.11	118.80
126	20.67	31.90	1.11	33.21	36.68	119.34
127	20.83	31.84	1.13	30.93	36.21	119.48
128	21.00	31.50	1.08	28.53	36.80	119.30
129	21.16	29.70	1.06	27.55	38.00	119.03
130	21.33	27.69	1.06	27.34	39.89	118.86
131	21.49	26.45	1.06	27.03	41.84	118.71
132	21.65	25.08	1.06	24.62	43.61	118.51
133	21.82	23.57	1.03	24.38	45.10	118.13
134	21.98	22.45	0.96	23.76	45.75	117.62
135	22.15	22.21	0.89	23.77	46.03	117.03
136	22.31	21.20	0.84	21.73	47.35	116.50
137	22.47	18.82	0.82	19.67	49.97	115.89
138	22.64	16.91	0.76	17.08	52.83	115.12
139	22.80	15.75	0.67	17.52	53.09	114.36
140	22.97	16.67	0.62	19.57	50.73	113.99
141	23.13	18.68	0.63	19.78	47.20	114.17
142	23.29	20.71	0.66	21.03	44.73	114.59
143	23.46	21.53	0.68	22.31	43.90	114.89
144	23.62	21.03	0.69	23.03	44.33	115.05

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
145	23.79	20.68	0.70	23.92	44.76	115.29
146	23.95	21.80	0.75	22.81	44.32	115.74
147	24.11	23.40	0.80	22.20	42.96	116.33
148	24.28	25.32	0.84	22.28	42.46	116.89
149	24.44	25.01	0.90	24.07	42.45	117.24
150	24.61	24.84	0.90	30.12	42.33	117.56
151	24.77	26.94	0.94	29.39	42.26	117.71
152	24.93	26.03	0.95	17.69	42.99	117.65
153	25.10	23.49	0.90	19.99	44.98	117.28
154	25.26	22.15	0.86	19.99	47.21	116.58
155	25.43	19.98	0.77	19.97	48.84	115.66
156	25.59	18.25	0.66	20.95	50.71	114.56
157	25.76	16.56	0.60	21.95	50.16	113.54
158	25.92	18.02	0.53	20.61	50.47	112.89
159	26.08	16.34	0.53	20.98	48.55	112.50
160	26.25	17.99	0.50	18.48	47.06	112.44
161	26.41	19.82	0.50	19.70	45.74	113.16
162	26.58	20.19	0.65	22.43	43.14	115.81
163	26.74	30.73	1.07	25.28	33.52	119.21
164	26.90	59.17	1.33	13.16	29.94	121.01
165	27.07	45.97	1.24	7.98	29.08	121.00
166	27.23	33.99	1.04	76.51	34.53	119.71
167	27.40	29.66	0.99	39.11	38.85	118.93
168	27.56	29.11	1.06	47.67	37.69	119.14
169	27.72	38.69	1.08	48.01	37.20	119.49
170	27.89	33.46	1.11	14.68	39.23	118.56
171	28.05	19.79	0.77	6.89	47.94	116.12
172	28.22	12.66	0.49	13.40	58.55	112.49
173	28.38	11.64	0.39	17.17	63.68	109.80
174	28.54	10.88	0.35	20.04	65.17	109.11
175	28.71	10.59	0.40	25.03	64.52	110.44
176	28.87	14.02	0.58	31.23	56.22	112.66
177	29.04	21.74	0.67	23.05	51.91	113.92
178	29.20	18.46	0.61	19.16	50.09	113.77
179	29.36	16.03	0.52	23.93	52.04	113.08
180	29.53	17.67	0.55	27.59	50.91	113.39
181	29.69	20.50	0.66	32.49	48.80	114.63
182	29.86	22.35	0.77	24.88	49.40	114.92
183	30.02	17.95	0.63	23.56	52.09	114.13
184	30.18	14.97	0.51	27.28	55.00	112.33
185	30.35	14.77	0.43	28.44	55.65	111.45
186	30.51	15.40	0.48	28.77	54.28	111.71
187	30.68	16.91	0.54	31.29	54.58	112.09
188	30.84	15.52	0.50	22.12	58.09	112.46
189	31.00	13.06	0.58	25.81	58.66	112.65
190	31.17	16.99	0.59	26.97	56.04	113.01
191	31.33	18.93	0.54	21.25	53.72	113.11
192	31.50	15.79	0.57	26.55	55.14	113.46

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
193	31.66	16.47	0.68	27.19	58.84	113.51
194	31.82	15.41	0.59	27.71	59.67	113.25
195	31.99	14.38	0.52	37.33	59.77	112.16
196	32.15	13.95	0.45	39.03	59.46	111.13
197	32.32	13.52	0.41	39.55	58.41	110.19
198	32.48	13.48	0.37	39.86	59.13	109.77
199	32.64	12.65	0.40	40.39	59.57	109.98
200	32.81	13.65	0.44	40.03	57.96	110.59
201	32.97	16.04	0.44	39.36	56.81	110.88
202	33.14	14.38	0.43	37.21	56.51	110.66
203	33.30	13.58	0.40	39.22	59.41	111.30
204	33.47	14.90	0.57	41.06	51.62	114.08
205	33.63	28.94	0.89	49.37	44.12	116.33
206	33.79	32.95	0.85	13.99	41.91	117.00
207	33.96	22.53	0.72	14.30	44.41	116.08
208	34.12	20.84	0.68	26.36	50.48	115.65
209	34.28	21.69	0.83	30.91	49.61	116.39
210	34.45	26.14	0.91	30.54	49.22	117.37
211	34.61	25.13	0.97	26.89	47.73	117.56
212	34.78	25.02	0.87	33.88	47.70	117.24
213	34.94	24.98	0.80	36.95	48.56	116.39
214	35.11	20.73	0.73	27.45	50.77	115.62
215	35.27	19.26	0.69	33.69	53.74	115.25
216	35.43	20.01	0.75	39.84	54.71	115.50
217	35.60	20.25	0.81	36.74	55.35	116.02
218	35.76	20.14	0.84	35.53	54.71	116.09
219	35.93	21.20	0.76	36.37	52.56	115.72
220	36.09	22.01	0.67	36.06	47.97	115.68
221	36.25	26.63	0.76	44.81	36.86	117.48
222	36.42	52.30	1.05	19.15	33.83	120.32
223	36.58	48.73	1.57	17.04	32.66	121.40
224	36.75	39.48	1.18	14.58	37.52	120.58
225	36.91	29.74	0.85	14.32	42.80	117.82
226	37.07	20.43	0.67	19.12	48.91	115.08
227	37.24	17.94	0.51	22.57	54.21	113.22
228	37.40	17.35	0.50	26.04	55.28	111.84
229	37.57	15.90	0.42	24.88	58.37	111.07
230	37.73	13.29	0.41	26.48	61.92	110.32
231	37.89	12.95	0.41	27.74	65.75	110.24
232	38.06	12.96	0.44	28.72	66.62	110.43
233	38.22	13.05	0.44	29.61	66.62	111.02
234	38.39	14.04	0.51	30.74	64.50	111.76
235	38.55	15.89	0.55	35.08	63.13	112.23
236	38.71	15.11	0.52	34.77	62.06	112.13
237	38.88	14.74	0.48	36.68	62.67	112.11
238	39.04	15.39	0.55	37.61	62.48	112.32
239	39.21	15.79	0.55	35.74	61.88	112.16
240	39.37	15.01	0.44	37.05	61.77	111.86

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
241	39.53	14.88	0.49	40.71	58.35	112.18
242	39.70	19.64	0.58	42.27	51.48	112.66
243	39.86	23.86	0.46	31.24	49.91	112.74
244	40.03	17.32	0.49	32.39	51.38	112.13
245	40.19	16.33	0.48	36.51	57.51	112.08
246	40.35	17.03	0.51	39.22	57.12	112.17
247	40.52	17.89	0.50	42.27	54.09	112.80
248	40.68	21.10	0.57	46.26	53.46	114.72
249	40.85	23.09	0.91	50.80	46.34	117.22
250	41.01	37.75	1.07	48.52	37.86	118.45
251	41.18	46.89	0.78	23.91	34.61	119.06
252	41.34	37.30	1.04	20.96	38.49	118.65
253	41.50	24.01	1.02	27.62	49.51	119.20
254	41.67	24.09	1.25	79.01	51.82	120.33
255	41.83	37.48	1.58	76.55	44.53	121.93
256	42.00	48.47	1.59	13.73	35.59	122.34
257	42.16	55.90	1.13	19.70	30.76	121.97
258	42.32	56.30	1.21	12.29	32.81	120.39
259	42.49	27.35	0.98	14.13	40.51	118.57
260	42.65	20.36	0.67	21.88	53.84	115.78
261	42.82	19.76	0.60	30.26	55.62	115.07
262	42.98	22.66	0.82	36.28	54.16	116.97
263	43.14	28.28	1.18	40.16	48.07	119.83
264	43.31	42.10	1.51	22.95	42.72	121.24
265	43.47	43.14	1.29	17.56	41.32	121.02
266	43.64	31.33	1.03	16.57	45.53	119.02
267	43.80	21.04	0.79	22.59	53.79	117.07
268	43.96	20.44	0.79	27.71	59.52	116.53
269	44.13	21.92	0.96	26.00	59.62	117.12
270	44.29	22.81	0.98	26.56	58.61	117.61
271	44.46	23.48	0.93	27.02	58.03	117.45
272	44.62	22.27	0.89	25.10	58.58	117.25
273	44.78	21.57	0.92	26.06	59.63	117.21
274	44.95	22.11	0.94	27.00	58.89	117.55
275	45.11	24.41	0.99	28.96	57.28	117.75
276	45.28	24.51	0.96	28.61	55.93	117.74
277	45.44	24.04	0.91	30.40	54.54	117.47
278	45.60	25.55	0.87	31.42	54.10	117.11
279	45.77	23.91	0.83	33.05	54.23	116.76
280	45.93	22.66	0.80	34.30	55.53	117.00
281	46.10	24.59	0.97	38.15	51.20	119.43
282	46.26	40.37	1.62	41.71	39.90	122.71
283	46.42	69.60	2.02	21.91	31.48	125.72
284	46.59	89.13	2.47	12.79	29.43	126.67
285	46.75	65.01	2.21	11.94	33.38	125.83
286	46.92	36.81	1.62	13.68	42.41	122.86
287	47.08	27.39	0.95	22.70	48.85	120.02
288	47.24	32.27	1.00	35.47	45.36	119.54

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
289	47.41	41.83	1.33	30.81	43.35	121.25
290	47.57	41.87	1.63	34.14	41.67	122.62
291	47.74	46.13	1.64	35.94	44.92	123.62
292	47.90	39.26	2.04	27.32	47.42	123.54
293	48.06	34.56	1.67	43.06	48.62	124.40
294	48.23	48.70	2.27	46.11	43.89	125.39
295	48.39	60.70	2.55	20.72	38.21	126.37
296	48.56	65.61	2.15	10.15	39.44	125.28
297	48.72	34.25	1.49	8.39	42.96	122.67
298	48.89	28.71	1.03	21.43	50.80	119.83
299	49.05	30.65	0.99	29.97	49.13	120.35
300	49.21	39.88	1.67	33.67	44.01	122.67
301	49.38	54.91	2.03	17.06	45.45	123.74
302	49.54	34.26	1.69	9.21	48.40	122.85
303	49.71	26.65	1.22	19.15	52.24	122.13
304	49.87	42.08	1.74	34.26	37.85	119.26
305	50.03	54.01	0.00	29.65	26.73	115.72
306	50.20	45.79	0.00	24.31	0.00	87.36

Abbreviations

Depth:	Depth from free surface, at which CPT was performed (ft)
q_c:	Measured cone resistance (tsf)
f_s:	Sleeve friction resistance (tsf)
u:	Pore pressure (tsf)
Fines content:	Percentage of fines in soil (%)
Unit weight:	Bulk soil unit weight (pcf)

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1	0.16	0.01	0.00	0.01	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
2	0.33	0.02	0.00	0.02	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
3	0.49	0.03	0.00	0.03	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
4	0.66	0.04	0.00	0.04	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
5	0.82	0.06	0.00	0.06	1.00	0.364	1.15	0.316	1.00	1.00	2.000	No
6	0.98	0.07	0.00	0.07	1.00	0.364	1.15	0.316	1.00	1.00	2.000	No
7	1.15	0.08	0.00	0.08	1.00	0.364	1.15	0.316	1.00	1.00	2.000	Yes
8	1.31	0.09	0.00	0.09	1.00	0.364	1.15	0.316	1.00	1.00	2.000	Yes
9	1.48	0.10	0.00	0.10	1.00	0.363	1.15	0.316	1.00	1.00	2.000	Yes
10	1.64	0.11	0.00	0.11	1.00	0.363	1.15	0.316	1.00	1.00	2.000	Yes
11	1.80	0.12	0.00	0.12	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
12	1.97	0.13	0.00	0.13	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
13	2.13	0.14	0.00	0.14	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
14	2.30	0.14	0.00	0.14	1.00	0.363	1.15	0.315	1.00	1.00	2.000	No
15	2.46	0.15	0.00	0.15	1.00	0.363	1.15	0.315	1.00	1.00	2.000	Yes
16	2.63	0.16	0.00	0.16	1.00	0.362	1.15	0.315	1.00	1.00	2.000	Yes
17	2.79	0.17	0.00	0.17	1.00	0.362	1.15	0.315	1.00	1.00	2.000	Yes
18	2.95	0.18	0.00	0.18	1.00	0.362	1.15	0.315	1.00	1.00	2.000	Yes
19	3.12	0.19	0.00	0.19	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
20	3.28	0.20	0.00	0.20	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
21	3.45	0.21	0.00	0.21	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
22	3.61	0.22	0.00	0.22	0.99	0.362	1.15	0.314	1.00	1.00	2.000	Yes
23	3.77	0.23	0.00	0.23	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
24	3.94	0.24	0.00	0.24	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
25	4.10	0.25	0.00	0.25	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
26	4.27	0.26	0.00	0.26	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
27	4.43	0.27	0.00	0.27	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
28	4.59	0.27	0.00	0.27	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
29	4.76	0.28	0.00	0.28	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
30	4.92	0.29	0.00	0.29	0.99	0.361	1.15	0.313	1.00	1.00	2.000	No
31	5.09	0.30	0.00	0.30	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
32	5.25	0.31	0.00	0.31	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
33	5.41	0.32	0.00	0.32	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
34	5.58	0.33	0.00	0.33	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
35	5.74	0.33	0.00	0.33	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
36	5.91	0.34	0.00	0.34	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
37	6.07	0.35	0.00	0.35	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
38	6.23	0.36	0.00	0.36	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
39	6.40	0.36	0.00	0.36	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
40	6.56	0.37	0.00	0.37	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
41	6.73	0.38	0.00	0.38	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
42	6.89	0.39	0.00	0.39	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
43	7.05	0.40	0.00	0.40	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
44	7.22	0.40	0.00	0.40	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
45	7.38	0.41	0.00	0.41	0.98	0.358	1.15	0.312	1.00	1.00	2.000	No
46	7.55	0.42	0.00	0.42	0.98	0.358	1.15	0.312	1.00	1.00	2.000	No
47	7.71	0.43	0.00	0.43	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
48	7.87	0.43	0.00	0.43	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
49	8.04	0.44	0.00	0.44	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
50	8.20	0.45	0.00	0.45	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
51	8.37	0.46	0.00	0.46	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
52	8.53	0.47	0.00	0.47	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
53	8.69	0.48	0.00	0.48	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
54	8.86	0.49	0.00	0.49	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
55	9.02	0.49	0.00	0.49	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
56	9.19	0.50	0.00	0.50	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
57	9.35	0.51	0.00	0.51	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
58	9.51	0.52	0.00	0.52	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
59	9.68	0.53	0.00	0.53	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
60	9.84	0.54	0.00	0.54	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
61	10.01	0.55	0.00	0.55	0.98	0.357	1.15	0.310	1.00	1.00	0.310	No
62	10.17	0.56	0.01	0.55	0.98	0.360	1.15	0.313	1.00	1.00	0.313	No
63	10.34	0.57	0.01	0.56	0.98	0.363	1.15	0.315	1.00	1.00	0.315	No
64	10.50	0.57	0.02	0.56	0.98	0.366	1.15	0.318	1.00	1.00	0.318	No
65	10.66	0.58	0.02	0.56	0.98	0.369	1.15	0.321	1.00	1.00	0.321	No
66	10.83	0.59	0.03	0.57	0.98	0.372	1.15	0.323	1.00	1.00	0.323	No
67	10.99	0.60	0.03	0.57	0.98	0.375	1.15	0.326	1.00	1.00	0.326	No
68	11.16	0.61	0.04	0.57	0.98	0.378	1.15	0.329	1.00	1.00	0.329	No
69	11.32	0.62	0.04	0.58	0.98	0.381	1.15	0.331	1.00	1.00	0.331	No
70	11.48	0.63	0.05	0.58	0.98	0.384	1.15	0.333	1.00	1.00	0.333	No
71	11.65	0.64	0.05	0.58	0.98	0.386	1.15	0.336	1.00	1.00	0.336	No
72	11.81	0.65	0.06	0.59	0.98	0.389	1.15	0.338	1.00	1.00	0.338	No
73	11.98	0.65	0.06	0.59	0.97	0.392	1.15	0.341	1.00	1.00	0.341	No
74	12.14	0.66	0.07	0.60	0.97	0.394	1.15	0.343	1.00	1.00	0.343	No
75	12.30	0.67	0.07	0.60	0.97	0.397	1.15	0.345	1.00	1.00	0.345	No
76	12.47	0.68	0.08	0.60	0.97	0.400	1.15	0.348	1.00	1.00	0.348	No
77	12.63	0.69	0.08	0.61	0.97	0.402	1.15	0.350	1.00	1.00	0.350	No
78	12.80	0.70	0.09	0.61	0.97	0.405	1.15	0.352	1.00	1.00	0.352	No
79	12.96	0.71	0.09	0.61	0.97	0.407	1.15	0.354	1.00	1.00	0.354	No
80	13.12	0.71	0.10	0.62	0.97	0.410	1.15	0.356	1.00	1.00	0.356	No
81	13.29	0.72	0.10	0.62	0.97	0.412	1.15	0.359	1.00	1.00	0.359	No
82	13.45	0.73	0.11	0.62	0.97	0.415	1.15	0.361	1.00	1.00	0.361	No
83	13.62	0.74	0.11	0.63	0.97	0.417	1.15	0.363	1.00	1.00	0.363	No
84	13.78	0.75	0.12	0.63	0.97	0.420	1.15	0.365	1.00	1.00	0.365	No
85	13.94	0.76	0.12	0.63	0.97	0.422	1.15	0.367	1.00	1.00	0.367	No
86	14.11	0.77	0.13	0.64	0.97	0.424	1.15	0.369	1.00	1.00	0.369	No
87	14.27	0.77	0.13	0.64	0.97	0.427	1.15	0.371	1.00	1.00	0.371	No
88	14.44	0.78	0.14	0.65	0.97	0.429	1.15	0.373	1.00	1.00	0.373	No
89	14.60	0.79	0.14	0.65	0.97	0.431	1.15	0.375	1.00	1.00	0.375	No
90	14.76	0.80	0.15	0.65	0.97	0.433	1.15	0.376	1.00	1.00	0.376	No
91	14.93	0.81	0.15	0.66	0.97	0.435	1.15	0.378	1.00	1.00	0.378	No
92	15.09	0.82	0.16	0.66	0.97	0.437	1.15	0.380	1.00	1.00	0.380	No
93	15.26	0.83	0.16	0.67	0.97	0.439	1.15	0.382	1.00	1.00	0.382	No
94	15.42	0.84	0.17	0.67	0.97	0.441	1.15	0.384	1.00	1.00	0.384	No
95	15.58	0.85	0.17	0.67	0.97	0.443	1.15	0.385	1.00	1.00	0.385	No
96	15.75	0.86	0.18	0.68	0.97	0.445	1.15	0.387	1.00	1.00	0.387	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
97	15.91	0.86	0.18	0.68	0.97	0.447	1.15	0.389	1.00	1.00	0.389	No
98	16.08	0.87	0.19	0.68	0.97	0.449	1.15	0.390	1.00	1.00	0.390	No
99	16.24	0.88	0.19	0.69	0.97	0.451	1.15	0.392	1.00	1.00	0.392	No
100	16.40	0.89	0.20	0.69	0.97	0.453	1.15	0.394	1.00	1.00	0.394	No
101	16.57	0.90	0.20	0.70	0.97	0.455	1.15	0.395	1.00	1.00	0.395	No
102	16.73	0.91	0.21	0.70	0.96	0.456	1.15	0.397	1.00	1.00	0.397	No
103	16.90	0.92	0.22	0.70	0.96	0.458	1.15	0.398	1.00	1.00	0.398	No
104	17.06	0.93	0.22	0.71	0.96	0.460	1.15	0.400	1.00	1.00	0.400	No
105	17.22	0.94	0.23	0.71	0.96	0.462	1.15	0.401	1.00	1.00	0.401	No
106	17.39	0.95	0.23	0.72	0.96	0.463	1.15	0.403	1.00	1.00	0.403	No
107	17.55	0.96	0.24	0.72	0.96	0.465	1.15	0.404	1.00	1.00	0.404	No
108	17.72	0.96	0.24	0.72	0.96	0.467	1.15	0.406	1.00	1.00	0.406	No
109	17.88	0.97	0.25	0.73	0.96	0.469	1.15	0.407	1.00	1.00	0.407	No
110	18.05	0.98	0.25	0.73	0.96	0.470	1.15	0.409	1.00	1.00	0.409	No
111	18.21	0.99	0.26	0.73	0.96	0.472	1.15	0.410	1.00	1.00	0.410	No
112	18.37	1.00	0.26	0.74	0.96	0.474	1.15	0.412	1.00	1.00	0.412	No
113	18.54	1.01	0.27	0.74	0.96	0.475	1.15	0.413	1.00	1.00	0.413	No
114	18.70	1.02	0.27	0.75	0.96	0.477	1.15	0.414	1.00	1.00	0.414	No
115	18.87	1.03	0.28	0.75	0.96	0.478	1.15	0.416	1.00	1.00	0.416	No
116	19.03	1.04	0.28	0.75	0.96	0.480	1.15	0.417	1.00	1.00	0.417	No
117	19.19	1.05	0.29	0.76	0.96	0.481	1.15	0.418	1.00	1.00	0.418	No
118	19.36	1.06	0.29	0.76	0.96	0.482	1.15	0.419	1.00	1.00	0.419	No
119	19.52	1.06	0.30	0.77	0.96	0.484	1.15	0.421	1.00	1.00	0.421	No
120	19.69	1.07	0.30	0.77	0.96	0.485	1.15	0.422	1.00	1.00	0.422	No
121	19.85	1.08	0.31	0.78	0.96	0.486	1.15	0.423	1.00	1.00	0.423	No
122	20.01	1.09	0.31	0.78	0.96	0.488	1.15	0.424	1.00	1.00	0.424	No
123	20.18	1.10	0.32	0.79	0.96	0.489	1.15	0.425	1.00	1.00	0.425	No
124	20.34	1.11	0.32	0.79	0.96	0.490	1.15	0.426	1.00	1.00	0.426	No
125	20.51	1.12	0.33	0.79	0.96	0.491	1.15	0.427	1.00	1.00	0.427	No
126	20.67	1.13	0.33	0.80	0.96	0.493	1.15	0.428	1.00	1.00	0.428	No
127	20.83	1.14	0.34	0.80	0.95	0.494	1.15	0.429	1.00	1.00	0.429	No
128	21.00	1.15	0.34	0.81	0.95	0.495	1.15	0.430	1.00	1.00	0.430	No
129	21.16	1.16	0.35	0.81	0.95	0.496	1.15	0.431	1.00	1.00	0.431	No
130	21.33	1.17	0.35	0.82	0.95	0.497	1.15	0.432	1.00	1.00	0.432	No
131	21.49	1.18	0.36	0.82	0.95	0.498	1.15	0.433	1.00	1.00	0.433	No
132	21.65	1.19	0.36	0.83	0.95	0.499	1.15	0.434	1.00	1.00	0.434	No
133	21.82	1.20	0.37	0.83	0.95	0.500	1.15	0.435	1.00	1.00	0.435	No
134	21.98	1.21	0.37	0.84	0.95	0.501	1.15	0.436	1.00	1.00	0.436	No
135	22.15	1.22	0.38	0.84	0.95	0.502	1.15	0.437	1.00	1.00	0.437	No
136	22.31	1.23	0.38	0.84	0.95	0.503	1.15	0.438	1.00	1.00	0.438	No
137	22.47	1.24	0.39	0.85	0.95	0.504	1.15	0.438	1.00	1.00	0.438	No
138	22.64	1.25	0.39	0.85	0.95	0.505	1.15	0.439	1.00	1.00	0.439	No
139	22.80	1.26	0.40	0.86	0.95	0.506	1.15	0.440	1.00	1.00	0.440	No
140	22.97	1.27	0.40	0.86	0.95	0.507	1.15	0.441	1.00	1.00	0.441	No
141	23.13	1.28	0.41	0.87	0.95	0.508	1.15	0.442	1.00	1.00	0.442	No
142	23.29	1.29	0.41	0.87	0.95	0.509	1.15	0.443	1.00	1.00	0.443	No
143	23.46	1.29	0.42	0.87	0.95	0.510	1.15	0.444	1.00	1.00	0.444	No
144	23.62	1.30	0.43	0.88	0.95	0.511	1.15	0.444	1.00	1.00	0.444	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
145	23.79	1.31	0.43	0.88	0.95	0.512	1.15	0.445	1.00	1.00	0.445	No
146	23.95	1.32	0.44	0.89	0.95	0.513	1.15	0.446	1.00	1.00	0.446	No
147	24.11	1.33	0.44	0.89	0.94	0.514	1.15	0.447	1.00	1.00	0.447	No
148	24.28	1.34	0.45	0.90	0.94	0.514	1.15	0.447	1.00	1.00	0.447	No
149	24.44	1.35	0.45	0.90	0.94	0.515	1.15	0.448	1.00	1.00	0.448	No
150	24.61	1.36	0.46	0.91	0.94	0.516	1.15	0.449	1.00	1.00	0.449	No
151	24.77	1.37	0.46	0.91	0.94	0.517	1.15	0.449	1.00	1.00	0.449	No
152	24.93	1.38	0.47	0.91	0.94	0.518	1.15	0.450	1.00	1.00	0.450	No
153	25.10	1.39	0.47	0.92	0.94	0.518	1.15	0.451	1.00	1.00	0.451	No
154	25.26	1.40	0.48	0.92	0.94	0.519	1.15	0.451	1.00	1.00	0.451	No
155	25.43	1.41	0.48	0.93	0.94	0.520	1.15	0.452	1.00	1.00	0.452	No
156	25.59	1.42	0.49	0.93	0.94	0.520	1.15	0.453	1.00	1.00	0.453	No
157	25.76	1.43	0.49	0.94	0.94	0.521	1.15	0.453	1.00	1.00	0.453	No
158	25.92	1.44	0.50	0.94	0.94	0.522	1.15	0.454	1.00	1.00	0.454	No
159	26.08	1.45	0.50	0.94	0.94	0.523	1.15	0.454	1.00	1.00	0.454	No
160	26.25	1.46	0.51	0.95	0.94	0.523	1.15	0.455	1.00	1.00	0.455	No
161	26.41	1.47	0.51	0.95	0.94	0.524	1.15	0.456	1.00	1.00	0.456	No
162	26.58	1.47	0.52	0.96	0.94	0.525	1.15	0.456	1.00	1.00	0.456	No
163	26.74	1.48	0.52	0.96	0.94	0.525	1.15	0.457	1.00	1.00	0.457	No
164	26.90	1.49	0.53	0.97	0.93	0.526	1.15	0.457	1.00	1.00	0.457	No
165	27.07	1.50	0.53	0.97	0.93	0.526	1.15	0.458	1.00	1.00	2.000	Yes
166	27.23	1.51	0.54	0.98	0.93	0.527	1.15	0.458	1.00	1.00	2.000	Yes
167	27.40	1.52	0.54	0.98	0.93	0.527	1.15	0.458	1.00	1.00	2.000	Yes
168	27.56	1.53	0.55	0.99	0.93	0.528	1.15	0.459	1.00	1.00	0.459	No
169	27.72	1.54	0.55	0.99	0.93	0.528	1.15	0.459	1.00	1.00	0.459	No
170	27.89	1.55	0.56	1.00	0.93	0.529	1.15	0.460	1.00	1.00	0.460	No
171	28.05	1.56	0.56	1.00	0.93	0.529	1.15	0.460	1.00	1.00	0.460	No
172	28.22	1.57	0.57	1.00	0.93	0.530	1.15	0.461	1.00	1.00	0.461	No
173	28.38	1.58	0.57	1.01	0.93	0.530	1.15	0.461	1.00	1.00	0.461	No
174	28.54	1.59	0.58	1.01	0.93	0.531	1.15	0.461	1.00	1.00	0.461	No
175	28.71	1.60	0.58	1.02	0.93	0.531	1.15	0.462	1.00	1.00	0.462	No
176	28.87	1.61	0.59	1.02	0.93	0.532	1.15	0.462	1.00	1.00	0.462	No
177	29.04	1.62	0.59	1.02	0.93	0.532	1.15	0.463	1.00	1.00	0.463	No
178	29.20	1.63	0.60	1.03	0.92	0.533	1.15	0.463	1.00	1.00	0.463	No
179	29.36	1.64	0.60	1.03	0.92	0.533	1.15	0.463	1.00	1.00	0.463	No
180	29.53	1.65	0.61	1.04	0.92	0.533	1.15	0.464	1.00	1.00	0.464	No
181	29.69	1.65	0.61	1.04	0.92	0.534	1.15	0.464	1.00	1.00	0.464	No
182	29.86	1.66	0.62	1.04	0.92	0.534	1.15	0.464	1.00	1.00	0.464	No
183	30.02	1.67	0.62	1.05	0.92	0.535	1.15	0.465	1.00	1.00	0.465	No
184	30.18	1.68	0.63	1.05	0.92	0.535	1.15	0.465	1.00	1.00	0.465	No
185	30.35	1.69	0.63	1.06	0.92	0.535	1.15	0.465	1.00	1.00	0.465	No
186	30.51	1.70	0.64	1.06	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
187	30.68	1.71	0.65	1.07	0.92	0.536	1.15	0.466	1.00	1.00	0.467	No
188	30.84	1.72	0.65	1.07	0.92	0.536	1.15	0.466	1.00	1.00	0.467	No
189	31.00	1.73	0.66	1.07	0.92	0.537	1.15	0.467	1.00	1.00	0.468	No
190	31.17	1.74	0.66	1.08	0.91	0.537	1.15	0.467	1.00	1.00	0.469	No
191	31.33	1.75	0.67	1.08	0.91	0.537	1.15	0.467	0.99	1.00	0.469	No
192	31.50	1.76	0.67	1.09	0.91	0.537	1.15	0.467	0.99	1.00	0.470	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
193	31.66	1.77	0.68	1.09	0.91	0.538	1.15	0.467	0.99	1.00	0.471	No
194	31.82	1.78	0.68	1.09	0.91	0.538	1.15	0.468	0.99	1.00	0.471	No
195	31.99	1.78	0.69	1.10	0.91	0.538	1.15	0.468	0.99	1.00	0.472	No
196	32.15	1.79	0.69	1.10	0.91	0.538	1.15	0.468	0.99	1.00	0.472	No
197	32.32	1.80	0.70	1.11	0.91	0.538	1.15	0.468	0.99	1.00	0.473	No
198	32.48	1.81	0.70	1.11	0.91	0.539	1.15	0.468	0.99	1.00	0.474	No
199	32.64	1.82	0.71	1.11	0.91	0.539	1.15	0.469	0.99	1.00	0.474	No
200	32.81	1.83	0.71	1.12	0.90	0.539	1.15	0.469	0.99	1.00	0.475	No
201	32.97	1.84	0.72	1.12	0.90	0.539	1.15	0.469	0.99	1.00	0.475	No
202	33.14	1.85	0.72	1.13	0.90	0.539	1.15	0.469	0.99	1.00	0.476	No
203	33.30	1.86	0.73	1.13	0.90	0.539	1.15	0.469	0.98	1.00	0.476	No
204	33.47	1.87	0.73	1.13	0.90	0.540	1.15	0.469	0.98	1.00	0.477	No
205	33.63	1.88	0.74	1.14	0.90	0.540	1.15	0.469	0.98	1.00	0.477	No
206	33.79	1.89	0.74	1.14	0.90	0.540	1.15	0.469	0.98	1.00	0.478	No
207	33.96	1.89	0.75	1.15	0.90	0.540	1.15	0.469	0.98	1.00	0.478	No
208	34.12	1.90	0.75	1.15	0.90	0.540	1.15	0.469	0.98	1.00	0.478	No
209	34.28	1.91	0.76	1.16	0.90	0.540	1.15	0.469	0.98	1.00	0.479	No
210	34.45	1.92	0.76	1.16	0.89	0.539	1.15	0.469	0.98	1.00	0.479	No
211	34.61	1.93	0.77	1.17	0.89	0.539	1.15	0.469	0.98	1.00	0.480	No
212	34.78	1.94	0.77	1.17	0.89	0.539	1.15	0.469	0.98	1.00	0.480	No
213	34.94	1.95	0.78	1.17	0.89	0.539	1.15	0.469	0.98	1.00	0.480	No
214	35.11	1.96	0.78	1.18	0.89	0.539	1.15	0.469	0.98	1.00	0.481	No
215	35.27	1.97	0.79	1.18	0.89	0.539	1.15	0.469	0.97	1.00	0.481	No
216	35.43	1.98	0.79	1.19	0.89	0.539	1.15	0.469	0.97	1.00	0.481	No
217	35.60	1.99	0.80	1.19	0.89	0.539	1.15	0.468	0.97	1.00	0.481	No
218	35.76	2.00	0.80	1.20	0.89	0.539	1.15	0.468	0.97	1.00	0.482	No
219	35.93	2.01	0.81	1.20	0.88	0.539	1.15	0.468	0.97	1.00	0.482	No
220	36.09	2.02	0.81	1.20	0.88	0.538	1.15	0.468	0.97	1.00	0.482	No
221	36.25	2.03	0.82	1.21	0.88	0.538	1.15	0.468	0.97	1.00	0.483	No
222	36.42	2.04	0.82	1.21	0.88	0.538	1.15	0.468	0.97	1.00	0.483	No
223	36.58	2.05	0.83	1.22	0.88	0.538	1.15	0.467	0.97	1.00	0.483	No
224	36.75	2.06	0.83	1.22	0.88	0.537	1.15	0.467	0.97	1.00	0.483	No
225	36.91	2.07	0.84	1.23	0.88	0.537	1.15	0.467	0.97	1.00	0.483	No
226	37.07	2.08	0.84	1.23	0.88	0.537	1.15	0.467	0.97	1.00	0.484	No
227	37.24	2.09	0.85	1.24	0.87	0.537	1.15	0.467	0.96	1.00	0.484	No
228	37.40	2.10	0.85	1.24	0.87	0.537	1.15	0.466	0.96	1.00	0.484	No
229	37.57	2.10	0.86	1.24	0.87	0.536	1.15	0.466	0.96	1.00	0.484	No
230	37.73	2.11	0.87	1.25	0.87	0.536	1.15	0.466	0.96	1.00	0.484	No
231	37.89	2.12	0.87	1.25	0.87	0.536	1.15	0.466	0.96	1.00	0.484	No
232	38.06	2.13	0.88	1.26	0.87	0.536	1.15	0.466	0.96	1.00	0.485	No
233	38.22	2.14	0.88	1.26	0.87	0.536	1.15	0.466	0.96	1.00	0.485	No
234	38.39	2.15	0.89	1.26	0.86	0.535	1.15	0.465	0.96	1.00	0.485	No
235	38.55	2.16	0.89	1.27	0.86	0.535	1.15	0.465	0.96	1.00	0.485	No
236	38.71	2.17	0.90	1.27	0.86	0.535	1.15	0.465	0.96	1.00	0.485	No
237	38.88	2.18	0.90	1.28	0.86	0.534	1.15	0.465	0.96	1.00	0.485	No
238	39.04	2.19	0.91	1.28	0.86	0.534	1.15	0.464	0.96	1.00	0.485	No
239	39.21	2.20	0.91	1.29	0.86	0.534	1.15	0.464	0.96	1.00	0.485	No
240	39.37	2.21	0.92	1.29	0.86	0.533	1.15	0.464	0.96	1.00	0.485	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
241	39.53	2.21	0.92	1.29	0.86	0.533	1.15	0.463	0.95	1.00	0.485	No
242	39.70	2.22	0.93	1.30	0.85	0.533	1.15	0.463	0.95	1.00	0.485	No
243	39.86	2.23	0.93	1.30	0.85	0.532	1.15	0.463	0.95	1.00	0.485	No
244	40.03	2.24	0.94	1.31	0.85	0.532	1.15	0.462	0.95	1.00	0.485	No
245	40.19	2.25	0.94	1.31	0.85	0.532	1.15	0.462	0.95	1.00	0.485	No
246	40.35	2.26	0.95	1.31	0.85	0.531	1.15	0.462	0.95	1.00	0.485	No
247	40.52	2.27	0.95	1.32	0.85	0.531	1.15	0.461	0.95	1.00	0.485	No
248	40.68	2.28	0.96	1.32	0.84	0.530	1.15	0.461	0.95	1.00	0.485	No
249	40.85	2.29	0.96	1.33	0.84	0.530	1.15	0.461	0.95	1.00	0.485	No
250	41.01	2.30	0.97	1.33	0.84	0.529	1.15	0.460	0.95	1.00	0.485	No
251	41.18	2.31	0.97	1.34	0.84	0.529	1.15	0.460	0.95	1.00	0.485	No
252	41.34	2.32	0.98	1.34	0.84	0.528	1.15	0.459	0.95	1.00	0.485	No
253	41.50	2.33	0.98	1.35	0.84	0.528	1.15	0.459	0.95	1.00	0.485	No
254	41.67	2.34	0.99	1.35	0.84	0.527	1.15	0.458	0.95	1.00	0.485	No
255	41.83	2.35	0.99	1.35	0.83	0.526	1.15	0.458	0.94	1.00	0.484	No
256	42.00	2.36	1.00	1.36	0.83	0.526	1.15	0.457	0.94	1.00	0.484	No
257	42.16	2.37	1.00	1.36	0.83	0.525	1.15	0.457	0.94	1.00	0.484	No
258	42.32	2.38	1.01	1.37	0.83	0.524	1.15	0.456	0.94	1.00	0.484	No
259	42.49	2.39	1.01	1.37	0.83	0.524	1.15	0.455	0.94	1.00	0.484	No
260	42.65	2.40	1.02	1.38	0.83	0.523	1.15	0.455	0.94	1.00	0.483	No
261	42.82	2.41	1.02	1.38	0.83	0.523	1.15	0.454	0.94	1.00	0.483	No
262	42.98	2.42	1.03	1.39	0.82	0.522	1.15	0.454	0.94	1.00	0.483	No
263	43.14	2.43	1.03	1.39	0.82	0.521	1.15	0.453	0.94	1.00	0.483	No
264	43.31	2.44	1.04	1.40	0.82	0.521	1.15	0.453	0.94	1.00	0.483	No
265	43.47	2.45	1.04	1.40	0.82	0.520	1.15	0.452	0.94	1.00	0.482	No
266	43.64	2.46	1.05	1.41	0.82	0.519	1.15	0.452	0.94	1.00	0.482	No
267	43.80	2.47	1.05	1.41	0.82	0.519	1.15	0.451	0.94	1.00	0.482	No
268	43.96	2.47	1.06	1.42	0.81	0.518	1.15	0.450	0.94	1.00	0.482	No
269	44.13	2.48	1.06	1.42	0.81	0.517	1.15	0.450	0.93	1.00	0.481	No
270	44.29	2.49	1.07	1.42	0.81	0.517	1.15	0.449	0.93	1.00	0.481	No
271	44.46	2.50	1.07	1.43	0.81	0.516	1.15	0.449	0.93	1.00	0.481	No
272	44.62	2.51	1.08	1.43	0.81	0.515	1.15	0.448	0.93	1.00	0.480	No
273	44.78	2.52	1.09	1.44	0.81	0.515	1.15	0.448	0.93	1.00	0.480	No
274	44.95	2.53	1.09	1.44	0.80	0.514	1.15	0.447	0.93	1.00	0.480	No
275	45.11	2.54	1.10	1.45	0.80	0.513	1.15	0.446	0.93	1.00	0.480	No
276	45.28	2.55	1.10	1.45	0.80	0.513	1.15	0.446	0.93	1.00	0.479	No
277	45.44	2.56	1.11	1.46	0.80	0.512	1.15	0.445	0.93	1.00	0.479	No
278	45.60	2.57	1.11	1.46	0.80	0.511	1.15	0.444	0.93	1.00	0.479	No
279	45.77	2.58	1.12	1.46	0.80	0.510	1.15	0.444	0.93	1.00	0.478	No
280	45.93	2.59	1.12	1.47	0.79	0.510	1.15	0.443	0.93	1.00	0.478	No
281	46.10	2.60	1.13	1.47	0.79	0.509	1.15	0.442	0.93	1.00	0.478	No
282	46.26	2.61	1.13	1.48	0.79	0.508	1.15	0.442	0.93	1.00	0.477	No
283	46.42	2.62	1.14	1.48	0.79	0.507	1.15	0.441	0.93	1.00	0.477	No
284	46.59	2.63	1.14	1.49	0.79	0.506	1.15	0.440	0.92	1.00	0.476	No
285	46.75	2.64	1.15	1.49	0.79	0.506	1.15	0.440	0.92	1.00	0.476	No
286	46.92	2.65	1.15	1.50	0.78	0.505	1.15	0.439	0.92	1.00	0.475	No
287	47.08	2.66	1.16	1.50	0.78	0.504	1.15	0.438	0.92	1.00	0.475	No
288	47.24	2.67	1.16	1.51	0.78	0.503	1.15	0.437	0.92	1.00	0.475	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
289	47.41	2.68	1.17	1.51	0.78	0.502	1.15	0.437	0.92	1.00	0.474	No
290	47.57	2.69	1.17	1.52	0.78	0.502	1.15	0.436	0.92	1.00	0.474	No
291	47.74	2.70	1.18	1.52	0.78	0.501	1.15	0.435	0.92	1.00	0.473	No
292	47.90	2.71	1.18	1.53	0.77	0.500	1.15	0.435	0.92	1.00	0.473	No
293	48.06	2.72	1.19	1.53	0.77	0.499	1.15	0.434	0.92	1.00	0.472	No
294	48.23	2.73	1.19	1.54	0.77	0.498	1.15	0.433	0.92	1.00	0.472	No
295	48.39	2.74	1.20	1.54	0.77	0.497	1.15	0.432	0.92	1.00	0.471	No
296	48.56	2.75	1.20	1.55	0.77	0.496	1.15	0.431	0.92	1.00	0.471	No
297	48.72	2.76	1.21	1.55	0.77	0.495	1.15	0.431	0.92	1.00	0.471	No
298	48.89	2.77	1.21	1.56	0.76	0.495	1.15	0.430	0.91	1.00	0.470	No
299	49.05	2.78	1.22	1.56	0.76	0.494	1.15	0.429	0.91	1.00	0.470	No
300	49.21	2.79	1.22	1.57	0.76	0.493	1.15	0.429	0.91	1.00	0.469	No
301	49.38	2.80	1.23	1.57	0.76	0.492	1.15	0.428	0.91	1.00	0.469	No
302	49.54	2.81	1.23	1.58	0.76	0.491	1.15	0.427	0.91	1.00	0.468	No
303	49.71	2.82	1.24	1.58	0.76	0.490	1.15	0.426	0.91	1.00	2.000	Yes
304	49.87	2.83	1.24	1.59	0.75	0.489	1.15	0.426	0.91	1.00	2.000	Yes
305	50.03	2.84	1.25	1.59	0.75	0.489	1.15	0.425	0.91	1.00	2.000	Yes
306	50.20	2.85	1.25	1.59	0.75	0.488	1.15	0.424	0.91	1.00	0.466	No

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1	0.16	771.93	1.02	0.50	0.50	1240.19	1.00	1240.19	4.000	No	No	2.00
2	0.33	767.87	1.13	0.66	0.50	1233.65	1.00	1233.65	4.000	No	No	2.00
3	0.49	718.27	1.25	0.86	0.50	1153.95	1.00	1153.95	4.000	No	No	2.00
4	0.66	560.72	1.35	1.01	0.50	900.80	1.00	900.80	4.000	No	No	2.00
5	0.82	411.03	1.42	1.05	0.50	660.29	1.00	660.29	4.000	No	No	2.00
6	0.98	268.45	1.54	1.11	0.50	431.19	1.00	431.19	4.000	No	No	2.00
7	1.15	138.54	1.81	1.51	0.56	222.46	1.12	248.39	4.000	Yes	No	2.00
8	1.31	67.01	2.19	2.57	0.70	107.53	1.65	177.53	4.000	Yes	No	2.00
9	1.48	33.62	2.52	3.77	0.83	53.86	2.87	154.77	4.000	Yes	No	2.00
10	1.64	23.64	2.64	3.96	0.87	37.81	3.61	136.37	4.000	Yes	Yes	2.00
11	1.80	20.57	2.63	3.20	0.87	32.86	3.49	114.65	4.000	No	Yes	2.00
12	1.97	16.66	2.72	3.45	0.90	26.56	4.12	109.55	4.000	No	Yes	2.00
13	2.13	17.00	2.69	3.24	0.89	27.10	3.95	106.91	4.000	No	Yes	2.00
14	2.30	18.44	2.66	3.12	0.88	29.39	3.68	108.20	4.000	No	Yes	2.00
15	2.46	19.07	2.65	3.20	0.88	30.39	3.66	111.07	4.000	Yes	Yes	2.00
16	2.63	24.35	2.54	2.84	0.83	38.87	2.96	115.24	4.000	Yes	No	2.00
17	2.79	37.15	2.33	2.23	0.76	59.40	2.05	121.80	4.000	Yes	No	2.00
18	2.95	52.57	2.14	1.73	0.68	84.17	1.54	129.69	4.000	Yes	No	2.00
19	3.12	62.06	2.02	1.35	0.64	99.39	1.32	131.54	4.000	Yes	No	2.00
20	3.28	63.61	1.93	1.01	0.60	101.88	1.22	123.87	4.000	Yes	No	2.00
21	3.45	62.07	1.87	0.81	0.58	99.38	1.17	115.88	4.000	Yes	No	2.00
22	3.61	54.15	1.97	0.98	0.62	86.65	1.27	109.82	4.000	Yes	No	2.00
23	3.77	38.69	2.19	1.43	0.70	61.80	1.64	101.60	4.000	Yes	No	2.00
24	3.94	23.63	2.48	2.27	0.81	37.58	2.69	101.16	4.000	Yes	No	2.00
25	4.10	14.05	2.72	2.81	0.90	22.18	4.15	92.05	4.000	Yes	Yes	2.00
26	4.27	10.62	2.83	2.96	0.95	16.65	5.08	84.60	4.000	Yes	Yes	2.00
27	4.43	8.71	2.92	3.15	0.98	13.56	5.91	80.09	4.000	Yes	Yes	2.00
28	4.59	7.11	3.04	3.82	1.00	10.98	7.26	79.68	4.000	No	Yes	2.00
29	4.76	6.48	3.10	4.10	1.00	9.96	7.89	78.59	4.000	No	Yes	2.00
30	4.92	6.63	3.06	3.59	1.00	10.18	7.38	75.12	4.000	No	Yes	2.00
31	5.09	6.91	2.99	2.90	1.00	10.62	6.60	70.09	4.000	No	Yes	2.00
32	5.25	7.11	2.92	2.32	0.98	10.93	5.92	64.75	4.000	No	Yes	2.00
33	5.41	7.38	2.88	2.03	0.96	11.35	5.48	62.20	4.000	No	Yes	2.00
34	5.58	7.26	2.88	1.96	0.96	11.15	5.47	60.97	4.000	No	Yes	2.00
35	5.74	6.92	2.89	1.88	0.97	10.58	5.56	58.81	4.000	No	Yes	2.00
36	5.91	5.82	2.95	1.87	0.99	8.80	6.24	54.91	4.000	No	Yes	2.00
37	6.07	4.98	3.01	1.84	1.00	7.45	6.88	51.21	4.000	No	Yes	2.00
38	6.23	4.44	3.05	1.77	1.00	6.56	7.35	48.20	4.000	No	Yes	2.00
39	6.40	4.31	3.07	1.78	1.00	6.34	7.52	47.62	4.000	No	Yes	2.00
40	6.56	4.27	3.07	1.74	1.00	6.26	7.51	47.01	4.000	No	Yes	2.00
41	6.73	5.02	2.97	1.48	1.00	7.46	6.38	47.53	4.000	No	Yes	2.00
42	6.89	5.83	2.89	1.37	0.97	8.74	5.60	48.90	4.000	No	Yes	2.00
43	7.05	6.40	2.82	1.14	0.94	9.65	4.92	47.41	4.000	No	Yes	2.00
44	7.22	5.61	2.87	1.15	0.96	8.37	5.42	45.34	4.000	No	Yes	2.00
45	7.38	4.98	2.91	1.05	0.97	7.34	5.75	42.17	4.000	No	Yes	2.00
46	7.55	4.78	3.00	1.52	1.00	7.01	6.69	46.92	4.000	No	Yes	2.00
47	7.71	5.17	3.03	2.10	1.00	7.61	7.12	54.21	4.000	No	Yes	2.00
48	7.87	5.16	3.10	2.82	1.00	7.59	7.94	60.28	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
49	8.04	4.96	3.15	3.27	1.00	7.25	8.61	62.46	4.000	No	Yes	2.00
50	8.20	4.87	3.17	3.44	1.00	7.10	8.89	63.10	4.000	No	Yes	2.00
51	8.37	5.15	3.17	3.64	1.00	7.54	8.78	66.16	4.000	No	Yes	2.00
52	8.53	5.67	3.16	4.05	1.00	8.36	8.64	72.23	4.000	No	Yes	2.00
53	8.69	6.25	3.15	4.49	1.00	9.27	8.52	78.94	4.000	No	Yes	2.00
54	8.86	6.80	3.13	4.70	1.00	10.15	8.26	83.81	4.000	No	Yes	2.00
55	9.02	7.28	3.11	4.89	1.00	10.90	8.08	88.09	4.000	No	Yes	2.00
56	9.19	7.70	3.10	5.09	1.00	11.56	7.97	92.13	4.000	No	Yes	2.00
57	9.35	8.47	3.07	5.14	1.00	12.79	7.58	96.87	4.000	No	Yes	2.00
58	9.51	9.04	3.04	5.06	1.00	13.69	7.25	99.33	4.000	No	Yes	2.00
59	9.68	9.42	3.02	4.90	1.00	14.29	6.98	99.79	4.000	No	Yes	2.00
60	9.84	9.45	3.01	4.71	1.00	14.31	6.86	98.14	4.000	No	Yes	2.00
61	10.01	9.73	2.97	4.25	1.00	14.75	6.43	94.89	4.000	No	Yes	2.00
62	10.17	10.19	2.91	3.66	0.98	15.48	5.85	90.48	4.000	No	Yes	2.00
63	10.34	10.21	2.89	3.31	0.97	15.50	5.58	86.50	4.000	No	Yes	2.00
64	10.50	10.05	2.89	3.25	0.97	15.23	5.59	85.13	4.000	No	Yes	2.00
65	10.66	9.91	2.91	3.43	0.98	14.99	5.78	86.69	4.000	No	Yes	2.00
66	10.83	10.25	2.89	3.38	0.97	15.52	5.63	87.41	4.000	No	Yes	2.00
67	10.99	10.73	2.87	3.31	0.96	16.28	5.42	88.25	4.000	No	Yes	2.00
68	11.16	10.99	2.85	3.18	0.95	16.68	5.24	87.41	4.000	No	Yes	2.00
69	11.32	10.96	2.86	3.27	0.96	16.62	5.32	88.45	4.000	No	Yes	2.00
70	11.48	10.25	2.90	3.44	0.97	15.46	5.68	87.86	4.000	No	Yes	2.00
71	11.65	9.62	2.93	3.59	0.99	14.43	6.04	87.11	4.000	No	Yes	2.00
72	11.81	9.11	2.96	3.69	1.00	13.61	6.32	86.03	4.000	No	Yes	2.00
73	11.98	9.35	2.94	3.53	0.99	13.97	6.11	85.29	4.000	No	Yes	2.00
74	12.14	9.27	2.95	3.56	0.99	13.83	6.17	85.28	4.000	No	Yes	2.00
75	12.30	8.97	2.96	3.52	0.99	13.33	6.27	83.58	4.000	No	Yes	2.00
76	12.47	8.79	2.95	3.40	0.99	13.03	6.25	81.48	4.000	No	Yes	2.00
77	12.63	8.72	2.94	3.13	0.99	12.91	6.07	78.36	4.000	No	Yes	2.00
78	12.80	8.55	2.93	2.98	0.98	12.62	6.02	75.98	4.000	No	Yes	2.00
79	12.96	8.05	2.95	2.94	0.99	11.79	6.24	73.55	4.000	No	Yes	2.00
80	13.12	7.76	2.97	2.95	1.00	11.32	6.40	72.49	4.000	No	Yes	2.00
81	13.29	7.94	2.95	2.79	0.99	11.57	6.17	71.37	4.000	No	Yes	2.00
82	13.45	8.19	2.92	2.63	0.98	11.85	5.94	70.33	4.000	No	Yes	2.00
83	13.62	8.37	2.91	2.52	0.98	12.02	5.78	69.45	4.000	No	Yes	2.00
84	13.78	8.50	2.92	2.72	0.98	12.17	5.92	72.09	4.000	No	Yes	2.00
85	13.94	8.89	2.93	3.02	0.98	12.73	6.02	76.67	4.000	No	Yes	2.00
86	14.11	9.54	2.93	3.29	0.98	13.65	6.00	81.89	4.000	No	Yes	2.00
87	14.27	11.01	2.87	3.12	0.96	15.65	5.40	84.56	4.000	No	Yes	2.00
88	14.44	11.73	2.86	3.27	0.96	16.61	5.33	88.47	4.000	No	Yes	2.00
89	14.60	12.83	2.85	3.46	0.95	18.12	5.19	94.07	4.000	No	Yes	2.00
90	14.76	16.61	2.74	3.18	0.91	23.19	4.29	99.55	4.000	No	Yes	2.00
91	14.93	21.90	2.59	2.49	0.85	29.92	3.25	97.12	0.165	No	No	0.44
92	15.09	22.90	2.53	2.13	0.83	30.86	2.95	91.02	0.150	No	No	0.40
93	15.26	18.33	2.60	2.07	0.86	24.66	3.35	82.66	4.000	No	Yes	2.00
94	15.42	12.22	2.80	2.57	0.93	16.51	4.79	79.04	4.000	No	Yes	2.00
95	15.58	10.61	2.87	2.77	0.96	14.27	5.41	77.26	4.000	No	Yes	2.00
96	15.75	12.16	2.81	2.61	0.94	16.26	4.86	79.09	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
97	15.91	14.45	2.77	2.77	0.92	19.29	4.50	86.73	4.000	No	Yes	2.00
98	16.08	15.52	2.78	3.17	0.93	20.72	4.59	95.08	4.000	No	Yes	2.00
99	16.24	14.63	2.84	3.73	0.95	19.54	5.15	100.57	4.000	No	Yes	2.00
100	16.40	13.45	2.88	3.93	0.97	17.88	5.55	99.28	4.000	No	Yes	2.00
101	16.57	12.73	2.92	4.08	0.98	16.84	5.85	98.60	4.000	No	Yes	2.00
102	16.73	12.56	2.93	4.25	0.99	16.53	6.03	99.67	4.000	No	Yes	2.00
103	16.90	12.07	2.97	4.55	1.00	15.82	6.38	100.90	4.000	No	Yes	2.00
104	17.06	11.57	2.98	4.53	1.00	15.03	6.55	98.48	4.000	No	Yes	2.00
105	17.22	11.56	2.95	4.02	0.99	14.87	6.24	92.83	4.000	No	Yes	2.00
106	17.39	11.79	2.92	3.55	0.98	15.02	5.87	88.19	4.000	No	Yes	2.00
107	17.55	11.81	2.90	3.28	0.97	14.92	5.68	84.76	4.000	No	Yes	2.00
108	17.72	11.33	2.91	3.27	0.98	14.20	5.85	83.02	4.000	No	Yes	2.00
109	17.88	11.04	2.91	3.07	0.98	13.72	5.81	79.66	4.000	No	Yes	2.00
110	18.05	11.33	2.88	2.74	0.96	13.97	5.46	76.32	4.000	No	Yes	2.00
111	18.21	12.29	2.82	2.48	0.94	15.06	4.99	75.08	4.000	No	Yes	2.00
112	18.37	13.05	2.82	2.70	0.94	15.98	4.99	79.74	4.000	No	Yes	2.00
113	18.54	13.95	2.84	3.18	0.95	17.13	5.16	88.36	4.000	No	Yes	2.00
114	18.70	14.69	2.88	3.85	0.96	18.08	5.47	98.89	4.000	No	Yes	2.00
115	18.87	15.64	2.88	4.21	0.97	19.23	5.51	105.94	4.000	No	Yes	2.00
116	19.03	16.41	2.87	4.31	0.96	20.11	5.43	109.19	4.000	No	Yes	2.00
117	19.19	16.71	2.86	4.22	0.96	20.35	5.33	108.53	4.000	No	Yes	2.00
118	19.36	17.10	2.85	4.08	0.95	20.70	5.20	107.57	4.000	No	Yes	2.00
119	19.52	17.73	2.83	3.92	0.94	21.33	5.01	106.80	4.000	No	Yes	2.00
120	19.69	19.30	2.78	3.67	0.93	23.08	4.63	106.80	4.000	No	Yes	2.00
121	19.85	21.33	2.73	3.46	0.91	25.36	4.24	107.64	4.000	No	Yes	2.00
122	20.01	23.87	2.69	3.35	0.89	28.24	3.91	110.53	4.000	No	Yes	2.00
123	20.18	26.17	2.66	3.37	0.88	30.83	3.73	114.90	4.000	No	Yes	2.00
124	20.34	28.23	2.65	3.48	0.88	33.12	3.63	120.22	4.000	No	Yes	2.00
125	20.51	30.08	2.64	3.56	0.87	35.14	3.55	124.78	4.000	No	Yes	2.00
126	20.67	31.44	2.63	3.61	0.87	36.56	3.49	127.78	4.000	No	Yes	2.00
127	20.83	32.19	2.62	3.56	0.86	37.23	3.43	127.84	4.000	No	Yes	2.00
128	21.00	31.43	2.63	3.59	0.87	36.17	3.51	126.94	4.000	No	Yes	2.00
129	21.16	30.03	2.65	3.69	0.88	34.39	3.67	126.09	4.000	No	Yes	2.00
130	21.33	28.34	2.69	3.90	0.89	32.32	3.92	126.68	4.000	No	Yes	2.00
131	21.49	26.79	2.73	4.14	0.91	30.41	4.19	127.37	4.000	No	Yes	2.00
132	21.65	25.40	2.76	4.33	0.92	28.70	4.44	127.36	4.000	No	Yes	2.00
133	21.82	24.05	2.78	4.44	0.93	27.01	4.65	125.71	4.000	No	Yes	2.00
134	21.98	23.09	2.80	4.38	0.93	25.76	4.75	122.32	4.000	No	Yes	2.00
135	22.15	22.29	2.80	4.25	0.93	24.69	4.79	118.28	4.000	No	Yes	2.00
136	22.31	21.06	2.82	4.28	0.94	23.17	4.99	115.52	4.000	No	Yes	2.00
137	22.47	19.26	2.87	4.47	0.96	21.03	5.38	113.24	4.000	No	Yes	2.00
138	22.64	17.42	2.91	4.63	0.98	18.86	5.83	109.92	4.000	No	Yes	2.00
139	22.80	16.70	2.92	4.43	0.98	17.93	5.87	105.26	4.000	No	Yes	2.00
140	22.97	17.31	2.88	4.01	0.96	18.47	5.50	101.63	4.000	No	Yes	2.00
141	23.13	18.98	2.82	3.61	0.94	20.20	4.96	100.26	4.000	No	Yes	2.00
142	23.29	20.61	2.78	3.40	0.93	21.88	4.60	100.64	4.000	No	Yes	2.00
143	23.46	21.41	2.76	3.36	0.92	22.65	4.48	101.45	4.000	No	Yes	2.00
144	23.62	21.41	2.77	3.44	0.92	22.55	4.54	102.41	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
145	23.79	21.50	2.78	3.54	0.93	22.55	4.60	103.83	4.000	No	Yes	2.00
146	23.95	22.29	2.77	3.58	0.92	23.30	4.54	105.79	4.000	No	Yes	2.00
147	24.11	23.83	2.75	3.54	0.91	24.85	4.35	107.97	4.000	No	Yes	2.00
148	24.28	24.91	2.74	3.59	0.91	25.89	4.27	110.66	4.000	No	Yes	2.00
149	24.44	25.42	2.74	3.66	0.91	26.33	4.27	112.51	4.000	No	Yes	2.00
150	24.61	26.00	2.73	3.71	0.91	26.82	4.26	114.17	4.000	No	Yes	2.00
151	24.77	26.31	2.73	3.73	0.91	27.02	4.25	114.76	4.000	No	Yes	2.00
152	24.93	25.81	2.75	3.80	0.91	26.37	4.35	114.69	4.000	No	Yes	2.00
153	25.10	24.17	2.78	3.96	0.93	24.52	4.64	113.69	4.000	No	Yes	2.00
154	25.26	22.16	2.82	4.06	0.94	22.30	4.97	110.72	4.000	No	Yes	2.00
155	25.43	20.42	2.85	4.02	0.95	20.35	5.21	106.05	4.000	No	Yes	2.00
156	25.59	18.57	2.88	3.96	0.96	18.31	5.50	100.63	4.000	No	Yes	2.00
157	25.76	17.91	2.87	3.63	0.96	17.52	5.41	94.82	4.000	No	Yes	2.00
158	25.92	17.28	2.88	3.49	0.96	16.77	5.46	91.54	4.000	No	Yes	2.00
159	26.08	17.74	2.84	3.19	0.95	17.15	5.17	88.58	4.000	No	Yes	2.00
160	26.25	18.33	2.82	3.02	0.94	17.67	4.94	87.34	4.000	No	Yes	2.00
161	26.41	19.62	2.80	3.03	0.93	18.92	4.75	89.81	4.000	No	Yes	2.00
162	26.58	23.90	2.75	3.30	0.92	23.23	4.37	101.52	4.000	No	Yes	2.00
163	26.74	36.99	2.56	2.87	0.84	36.36	3.10	112.74	0.213	No	No	0.47
164	26.90	45.51	2.48	2.76	0.81	44.76	2.69	120.22	0.242	No	No	0.53
165	27.07	46.85	2.46	2.65	0.81	45.89	2.59	118.92	4.000	Yes	No	2.00
166	27.23	37.13	2.58	3.06	0.85	36.05	3.22	116.22	4.000	Yes	No	2.00
167	27.40	31.70	2.67	3.42	0.88	30.49	3.78	115.23	4.000	Yes	Yes	2.00
168	27.56	33.13	2.65	3.31	0.88	31.78	3.63	115.23	4.000	No	Yes	2.00
169	27.72	34.28	2.64	3.32	0.87	32.78	3.56	116.74	4.000	No	Yes	2.00
170	27.89	30.98	2.68	3.36	0.89	29.37	3.83	112.49	4.000	No	Yes	2.00
171	28.05	22.14	2.83	3.85	0.95	20.52	5.07	104.14	4.000	No	Yes	2.00
172	28.22	14.88	3.00	4.14	1.00	13.26	6.75	89.55	4.000	No	Yes	2.00
173	28.38	11.97	3.08	3.95	1.00	10.31	7.62	78.56	4.000	No	Yes	2.00
174	28.54	11.34	3.10	3.90	1.00	9.64	7.87	75.87	4.000	No	Yes	2.00
175	28.71	12.20	3.09	4.20	1.00	10.44	7.76	81.02	4.000	No	Yes	2.00
176	28.87	15.83	2.97	3.88	1.00	13.95	6.37	88.92	4.000	No	Yes	2.00
177	29.04	18.43	2.90	3.71	0.97	16.41	5.68	93.25	4.000	No	Yes	2.00
178	29.20	19.06	2.87	3.46	0.96	16.94	5.40	91.53	4.000	No	Yes	2.00
179	29.36	17.73	2.90	3.50	0.97	15.58	5.71	88.90	4.000	No	Yes	2.00
180	29.53	18.47	2.88	3.44	0.97	16.23	5.53	89.70	4.000	No	Yes	2.00
181	29.69	20.58	2.85	3.50	0.95	18.18	5.20	94.61	4.000	No	Yes	2.00
182	29.86	20.66	2.86	3.62	0.96	18.17	5.30	96.21	4.000	No	Yes	2.00
183	30.02	18.79	2.90	3.72	0.97	16.31	5.71	93.19	4.000	No	Yes	2.00
184	30.18	16.28	2.95	3.58	0.99	13.86	6.18	85.58	4.000	No	Yes	2.00
185	30.35	15.45	2.96	3.43	0.99	13.02	6.28	81.75	4.000	No	Yes	2.00
186	30.51	16.12	2.94	3.34	0.99	13.59	6.06	82.34	4.000	No	Yes	2.00
187	30.68	16.34	2.94	3.45	0.99	13.73	6.11	83.87	4.000	No	Yes	2.00
188	30.84	15.54	2.99	3.91	1.00	12.93	6.68	86.34	4.000	No	Yes	2.00
189	31.00	15.55	3.00	4.01	1.00	12.88	6.77	87.20	4.000	No	Yes	2.00
190	31.17	16.68	2.96	3.81	1.00	13.87	6.34	87.97	4.000	No	Yes	2.00
191	31.33	17.60	2.93	3.57	0.98	14.66	5.97	87.51	4.000	No	Yes	2.00
192	31.50	17.42	2.95	3.81	0.99	14.43	6.20	89.45	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
193	31.66	16.28	3.01	4.23	1.00	13.31	6.80	90.58	4.000	No	Yes	2.00
194	31.82	15.86	3.02	4.24	1.00	12.87	6.94	89.34	4.000	No	Yes	2.00
195	31.99	15.08	3.02	3.94	1.00	12.10	6.96	84.21	4.000	No	Yes	2.00
196	32.15	14.51	3.01	3.63	1.00	11.53	6.91	79.64	4.000	No	Yes	2.00
197	32.32	14.22	3.00	3.29	1.00	11.22	6.73	75.55	4.000	No	Yes	2.00
198	32.48	13.79	3.01	3.25	1.00	10.79	6.85	73.94	4.000	No	Yes	2.00
199	32.64	13.84	3.02	3.33	1.00	10.79	6.92	74.68	4.000	No	Yes	2.00
200	32.81	14.69	2.99	3.32	1.00	11.50	6.66	76.57	4.000	No	Yes	2.00
201	32.97	15.25	2.97	3.27	1.00	11.95	6.47	77.32	4.000	No	Yes	2.00
202	33.14	15.22	2.97	3.18	1.00	11.88	6.42	76.25	4.000	No	Yes	2.00
203	33.30	14.85	3.01	3.60	1.00	11.50	6.90	79.31	4.000	No	Yes	2.00
204	33.47	19.76	2.89	3.48	0.97	15.81	5.64	89.16	4.000	No	Yes	2.00
205	33.63	26.10	2.77	3.18	0.92	21.39	4.51	96.53	4.000	No	Yes	2.00
206	33.79	28.51	2.73	3.08	0.91	23.46	4.20	98.50	4.000	No	Yes	2.00
207	33.96	25.70	2.77	3.15	0.92	20.88	4.55	95.05	4.000	No	Yes	2.00
208	34.12	22.03	2.88	3.70	0.96	17.53	5.46	95.73	4.000	No	Yes	2.00
209	34.28	23.31	2.86	3.77	0.96	18.57	5.33	98.98	4.000	No	Yes	2.00
210	34.45	24.74	2.85	3.97	0.96	19.74	5.27	104.00	4.000	No	Yes	2.00
211	34.61	25.87	2.83	3.83	0.95	20.65	5.04	104.13	4.000	No	Yes	2.00
212	34.78	25.51	2.83	3.73	0.95	20.26	5.04	102.07	4.000	No	Yes	2.00
213	34.94	24.05	2.84	3.62	0.95	18.91	5.17	97.74	4.000	No	Yes	2.00
214	35.11	22.13	2.88	3.67	0.96	17.17	5.51	94.57	4.000	No	Yes	2.00
215	35.27	20.48	2.93	3.90	0.98	15.68	5.97	93.66	4.000	No	Yes	2.00
216	35.43	20.37	2.94	4.07	0.99	15.51	6.13	95.04	4.000	No	Yes	2.00
217	35.60	20.67	2.95	4.28	0.99	15.69	6.23	97.77	4.000	No	Yes	2.00
218	35.76	21.05	2.94	4.21	0.99	15.95	6.13	97.76	4.000	No	Yes	2.00
219	35.93	21.63	2.91	3.85	0.98	16.40	5.79	94.88	4.000	No	Yes	2.00
220	36.09	23.84	2.83	3.33	0.95	18.24	5.08	92.63	4.000	No	Yes	2.00
221	36.25	34.13	2.63	2.57	0.87	27.01	3.52	95.00	4.000	No	Yes	2.00
222	36.42	42.94	2.57	2.76	0.85	34.41	3.14	107.99	0.197	No	No	0.41
223	36.58	47.08	2.54	2.81	0.84	37.81	3.00	113.33	0.215	No	No	0.45
224	36.75	39.54	2.64	3.20	0.87	31.19	3.60	112.40	4.000	No	Yes	2.00
225	36.91	30.11	2.74	3.21	0.91	23.13	4.32	100.00	4.000	No	Yes	2.00
226	37.07	22.97	2.85	3.25	0.95	17.07	5.22	89.14	4.000	No	Yes	2.00
227	37.24	18.90	2.94	3.34	0.99	13.62	6.05	82.41	4.000	No	Yes	2.00
228	37.40	17.42	2.95	3.12	0.99	12.36	6.22	76.89	4.000	No	Yes	2.00
229	37.57	15.88	3.00	3.22	1.00	11.07	6.72	74.43	4.000	No	Yes	2.00
230	37.73	14.43	3.05	3.36	1.00	9.86	7.32	72.15	4.000	No	Yes	2.00
231	37.89	13.46	3.10	3.69	1.00	9.05	7.97	72.20	4.000	No	Yes	2.00
232	38.06	13.40	3.12	3.82	1.00	8.97	8.13	72.85	4.000	No	Yes	2.00
233	38.22	13.78	3.12	3.97	1.00	9.23	8.12	74.99	4.000	No	Yes	2.00
234	38.39	14.78	3.09	3.95	1.00	9.99	7.76	77.50	4.000	No	Yes	2.00
235	38.55	15.50	3.07	3.93	1.00	10.51	7.52	79.08	4.000	No	Yes	2.00
236	38.71	15.76	3.05	3.78	1.00	10.68	7.34	78.38	4.000	No	Yes	2.00
237	38.88	15.60	3.06	3.83	1.00	10.51	7.45	78.29	4.000	No	Yes	2.00
238	39.04	15.83	3.06	3.86	1.00	10.65	7.41	78.98	4.000	No	Yes	2.00
239	39.21	15.93	3.05	3.75	1.00	10.68	7.31	78.12	4.000	No	Yes	2.00
240	39.37	15.77	3.05	3.65	1.00	10.52	7.29	76.75	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
241	39.53	17.09	3.00	3.39	1.00	11.50	6.72	77.30	4.000	No	Yes	2.00
242	39.70	20.01	2.89	2.87	0.97	13.79	5.62	77.49	4.000	No	Yes	2.00
243	39.86	20.78	2.87	2.75	0.96	14.37	5.37	77.24	4.000	No	Yes	2.00
244	40.03	19.65	2.89	2.75	0.97	13.42	5.60	75.18	4.000	No	Yes	2.00
245	40.19	17.41	2.99	3.26	1.00	11.58	6.58	76.22	4.000	No	Yes	2.00
246	40.35	17.65	2.98	3.24	1.00	11.71	6.52	76.37	4.000	No	Yes	2.00
247	40.52	19.29	2.93	3.10	0.99	12.95	6.03	78.10	4.000	No	Yes	2.00
248	40.68	21.36	2.92	3.47	0.98	14.49	5.93	85.94	4.000	No	Yes	2.00
249	40.85	28.01	2.81	3.31	0.94	19.67	4.83	95.10	4.000	No	Yes	2.00
250	41.01	36.50	2.65	2.69	0.88	26.43	3.65	96.41	4.000	No	Yes	2.00
251	41.18	41.09	2.58	2.48	0.85	30.05	3.23	97.18	0.165	No	No	0.34
252	41.34	36.41	2.66	2.78	0.88	26.15	3.73	97.60	4.000	No	Yes	2.00
253	41.50	29.08	2.86	4.12	0.96	20.09	5.31	106.75	4.000	No	Yes	2.00
254	41.67	29.41	2.90	4.73	0.97	20.19	5.67	114.49	4.000	No	Yes	2.00
255	41.83	37.49	2.77	4.19	0.92	26.43	4.57	120.77	4.000	No	Yes	2.00
256	42.00	47.81	2.60	3.15	0.86	34.62	3.36	116.20	4.000	No	Yes	2.00
257	42.16	53.78	2.50	2.55	0.82	39.43	2.78	109.48	0.202	No	No	0.42
258	42.32	46.74	2.55	2.49	0.84	33.78	3.02	101.85	0.178	No	No	0.37
259	42.49	34.90	2.70	2.93	0.90	24.31	4.00	97.32	4.000	No	Yes	2.00
260	42.65	22.81	2.93	3.67	0.98	14.87	5.99	89.07	4.000	No	Yes	2.00
261	42.82	21.35	2.96	3.67	0.99	13.72	6.28	86.12	4.000	No	Yes	2.00
262	42.98	24.08	2.93	4.00	0.99	15.68	6.04	94.71	4.000	No	Yes	2.00
263	43.14	31.49	2.84	4.02	0.95	21.18	5.09	107.89	4.000	No	Yes	2.00
264	43.31	38.23	2.74	3.71	0.91	26.26	4.31	113.21	4.000	No	Yes	2.00
265	43.47	39.13	2.72	3.49	0.90	26.90	4.12	110.73	4.000	No	Yes	2.00
266	43.64	32.11	2.79	3.51	0.93	21.50	4.72	101.41	4.000	No	Yes	2.00
267	43.80	24.59	2.93	3.94	0.98	15.76	5.98	94.27	4.000	No	Yes	2.00
268	43.96	21.50	3.02	4.45	1.00	13.44	6.92	92.98	4.000	No	Yes	2.00
269	44.13	22.11	3.02	4.63	1.00	13.82	6.93	95.84	4.000	No	Yes	2.00
270	44.29	23.12	3.00	4.64	1.00	14.48	6.76	97.98	4.000	No	Yes	2.00
271	44.46	23.23	2.99	4.51	1.00	14.51	6.67	96.76	4.000	No	Yes	2.00
272	44.62	22.82	3.00	4.51	1.00	14.17	6.76	95.76	4.000	No	Yes	2.00
273	44.78	22.36	3.02	4.62	1.00	13.80	6.93	95.67	4.000	No	Yes	2.00
274	44.95	23.09	3.01	4.62	1.00	14.26	6.81	97.09	4.000	No	Yes	2.00
275	45.11	24.08	2.98	4.47	1.00	14.89	6.55	97.46	4.000	No	Yes	2.00
276	45.28	24.74	2.96	4.29	1.00	15.31	6.33	96.85	4.000	No	Yes	2.00
277	45.44	25.13	2.94	4.05	0.99	15.57	6.10	94.97	4.000	No	Yes	2.00
278	45.60	24.96	2.93	3.89	0.99	15.40	6.03	92.90	4.000	No	Yes	2.00
279	45.77	24.51	2.94	3.81	0.99	15.04	6.05	91.04	4.000	No	Yes	2.00
280	45.93	24.23	2.96	4.00	0.99	14.76	6.26	92.38	4.000	No	Yes	2.00
281	46.10	29.75	2.89	4.16	0.97	18.62	5.57	103.79	4.000	No	Yes	2.00
282	46.26	45.34	2.69	3.59	0.89	29.96	3.92	117.44	4.000	No	Yes	2.00
283	46.42	66.73	2.52	3.18	0.83	45.81	2.86	130.97	0.289	No	No	0.61
284	46.59	74.80	2.47	3.09	0.81	51.72	2.63	135.97	0.314	No	No	0.66
285	46.75	63.83	2.56	3.43	0.84	43.23	3.08	133.32	0.300	No	No	0.63
286	46.92	43.30	2.74	3.91	0.91	27.97	4.27	119.39	4.000	No	Yes	2.00
287	47.08	32.50	2.85	3.98	0.95	20.17	5.21	105.14	4.000	No	Yes	2.00
288	47.24	34.26	2.79	3.46	0.93	21.46	4.69	100.66	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
289	47.41	39.14	2.75	3.62	0.92	24.82	4.40	109.20	4.000	No	Yes	2.00
290	47.57	43.76	2.72	3.73	0.91	27.99	4.16	116.56	4.000	No	Yes	2.00
291	47.74	42.89	2.78	4.40	0.93	27.09	4.63	125.32	4.000	No	Yes	2.00
292	47.90	40.49	2.82	4.73	0.94	25.23	5.00	126.09	4.000	No	Yes	2.00
293	48.06	41.40	2.84	5.15	0.95	25.68	5.18	132.92	4.000	No	Yes	2.00
294	48.23	48.51	2.76	4.73	0.92	30.65	4.48	137.26	4.000	No	Yes	2.00
295	48.39	58.71	2.66	4.15	0.88	37.93	3.69	140.09	4.000	No	Yes	2.00
296	48.56	53.71	2.68	4.04	0.89	34.31	3.86	132.40	4.000	No	Yes	2.00
297	48.72	43.05	2.75	3.86	0.91	26.79	4.35	116.43	4.000	No	Yes	2.00
298	48.89	31.49	2.88	4.07	0.97	18.67	5.51	102.91	4.000	No	Yes	2.00
299	49.05	33.49	2.85	4.00	0.95	19.99	5.25	105.03	4.000	No	Yes	2.00
300	49.21	42.20	2.77	3.97	0.92	25.92	4.50	116.49	4.000	No	Yes	2.00
301	49.38	43.30	2.79	4.43	0.93	26.45	4.70	124.45	4.000	No	Yes	2.00
302	49.54	38.82	2.84	4.57	0.95	23.27	5.14	119.71	4.000	No	Yes	2.00
303	49.71	34.63	2.90	4.88	0.97	20.30	5.74	116.46	4.000	Yes	Yes	2.00
304	49.87	41.31	2.65	2.57	0.88	25.47	3.65	92.86	4.000	Yes	Yes	2.00
305	50.03	47.72	2.41	1.29	0.78	30.77	2.34	72.14	4.000	Yes	No	2.00
306	50.20	48.91	-0.98	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
I_c: Soil behavior type index
Fr: Normalized friction ratio (%)
n: Stress exponent
Q_{tn}: Normalized cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cydic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.98	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.93	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.88	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.83	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.78	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.73	0.16	0.00	1.97	2.00	0.00	9.70	0.17	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.63	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.45	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.38	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.33	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.28	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.23	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.18	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.13	0.16	0.00	5.91	2.00	0.00	9.10	0.17	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.78	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.73	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.68	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.63	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.58	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.53	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.34	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.16	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.18	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.13	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.08	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.03	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.98	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.93	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	2.00	0.00	7.80	0.16	0.00
14.60	2.00	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	0.44	0.56	7.72	0.16	0.22	15.09	0.40	0.60	7.70	0.16	0.23
15.26	2.00	0.00	7.67	0.16	0.00	15.42	2.00	0.00	7.65	0.16	0.00
15.58	2.00	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.58	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.53	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.48	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.43	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.38	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.33	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.05	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.87	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.98	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.93	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	2.00	0.00	6.88	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.83	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	2.00	0.00	6.78	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	2.00	0.00	6.60	0.16	0.00
22.47	2.00	0.00	6.57	0.16	0.00	22.64	2.00	0.00	6.55	0.16	0.00
22.80	2.00	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.43	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.38	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.33	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.28	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.23	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.18	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.76	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.58	2.00	0.00	5.95	0.16	0.00
26.74	0.47	0.53	5.92	0.16	0.16	26.90	0.53	0.47	5.90	0.16	0.14
27.07	2.00	0.00	5.87	0.16	0.00	27.23	2.00	0.00	5.85	0.16	0.00
27.40	2.00	0.00	5.83	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.78	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.73	0.16	0.00	28.22	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.68	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.63	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.58	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.23	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.18	0.16	0.00	31.82	2.00	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.13	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.08	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.03	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.98	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.47	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	2.00	0.00	4.80	0.16	0.00
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.11	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.63	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.58	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.53	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.48	0.16	0.00	36.42	0.41	0.59	4.45	0.16	0.13
36.58	0.45	0.55	4.43	0.16	0.12	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.38	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.03	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.98	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.93	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.88	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.83	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.78	0.16	0.00	41.01	2.00	0.00	3.75	0.17	0.00
41.18	0.34	0.66	3.72	0.16	0.12	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	2.00	0.00	3.62	0.16	0.00	42.00	2.00	0.00	3.60	0.16	0.00
42.16	0.42	0.58	3.57	0.16	0.10	42.32	0.37	0.63	3.55	0.16	0.11
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.82	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.43	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.38	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.33	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.28	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.23	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.18	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	0.61	0.39	2.92	0.16	0.06	46.59	0.66	0.34	2.90	0.16	0.05
46.75	0.63	0.37	2.87	0.16	0.05	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.83	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.78	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.73	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.68	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.63	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.58	0.16	0.00	48.89	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.71	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	2.00	0.00	2.37	0.16	0.00	50.20	2.00	0.00	2.35	0.16	0.00

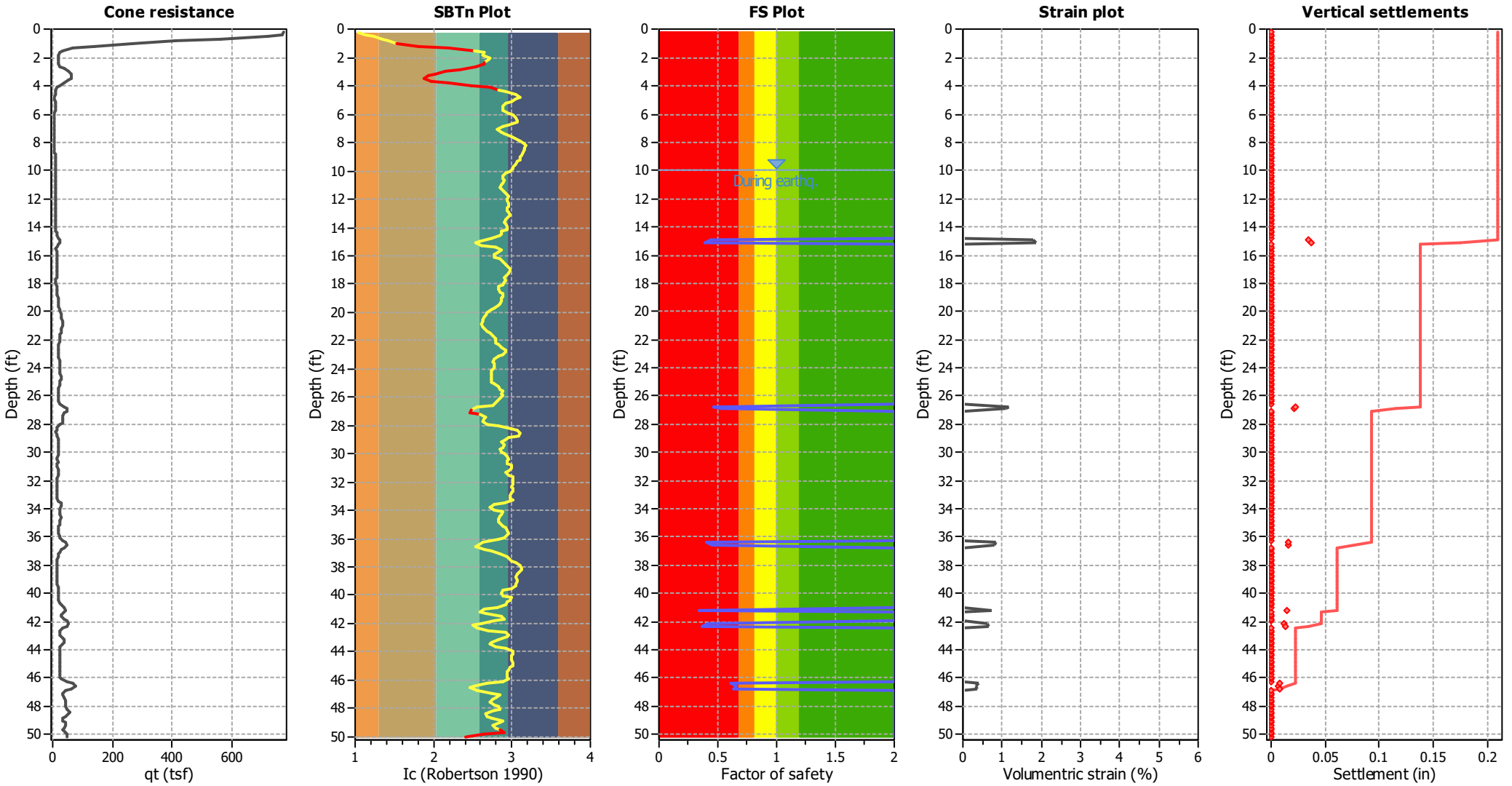
Overall liquefaction potential: 1.50

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
10.01	94.89	2.00	0.00	0.83	0.00	10.17	90.48	2.00	0.00	0.83	0.00
10.34	86.50	2.00	0.00	0.82	0.00	10.50	85.13	2.00	0.00	0.82	0.00
10.66	86.69	2.00	0.00	0.82	0.00	10.83	87.41	2.00	0.00	0.82	0.00
10.99	88.25	2.00	0.00	0.81	0.00	11.16	87.41	2.00	0.00	0.81	0.00
11.32	88.45	2.00	0.00	0.81	0.00	11.48	87.86	2.00	0.00	0.81	0.00
11.65	87.11	2.00	0.00	0.80	0.00	11.81	86.03	2.00	0.00	0.80	0.00
11.98	85.29	2.00	0.00	0.80	0.00	12.14	85.28	2.00	0.00	0.79	0.00
12.30	83.58	2.00	0.00	0.79	0.00	12.47	81.48	2.00	0.00	0.79	0.00
12.63	78.36	2.00	0.00	0.79	0.00	12.80	75.98	2.00	0.00	0.78	0.00
12.96	73.55	2.00	0.00	0.78	0.00	13.12	72.49	2.00	0.00	0.78	0.00
13.29	71.37	2.00	0.00	0.77	0.00	13.45	70.33	2.00	0.00	0.77	0.00
13.62	69.45	2.00	0.00	0.77	0.00	13.78	72.09	2.00	0.00	0.77	0.00
13.94	76.67	2.00	0.00	0.76	0.00	14.11	81.89	2.00	0.00	0.76	0.00
14.27	84.56	2.00	0.00	0.76	0.00	14.44	88.47	2.00	0.00	0.76	0.00
14.60	94.07	2.00	0.00	0.75	0.00	14.76	99.55	2.00	0.00	0.75	0.00
14.93	97.12	0.44	1.79	0.75	0.04	15.09	91.02	0.40	1.88	0.74	0.04
15.26	82.66	2.00	0.00	0.74	0.00	15.42	79.04	2.00	0.00	0.74	0.00
15.58	77.26	2.00	0.00	0.74	0.00	15.75	79.09	2.00	0.00	0.73	0.00
15.91	86.73	2.00	0.00	0.73	0.00	16.08	95.08	2.00	0.00	0.73	0.00
16.24	100.57	2.00	0.00	0.72	0.00	16.40	99.28	2.00	0.00	0.72	0.00
16.57	98.60	2.00	0.00	0.72	0.00	16.73	99.67	2.00	0.00	0.72	0.00
16.90	100.90	2.00	0.00	0.71	0.00	17.06	98.48	2.00	0.00	0.71	0.00
17.22	92.83	2.00	0.00	0.71	0.00	17.39	88.19	2.00	0.00	0.71	0.00
17.55	84.76	2.00	0.00	0.70	0.00	17.72	83.02	2.00	0.00	0.70	0.00
17.88	79.66	2.00	0.00	0.70	0.00	18.05	76.32	2.00	0.00	0.69	0.00
18.21	75.08	2.00	0.00	0.69	0.00	18.37	79.74	2.00	0.00	0.69	0.00
18.54	88.36	2.00	0.00	0.69	0.00	18.70	98.89	2.00	0.00	0.68	0.00
18.87	105.94	2.00	0.00	0.68	0.00	19.03	109.19	2.00	0.00	0.68	0.00
19.19	108.53	2.00	0.00	0.67	0.00	19.36	107.57	2.00	0.00	0.67	0.00
19.52	106.80	2.00	0.00	0.67	0.00	19.69	106.80	2.00	0.00	0.67	0.00
19.85	107.64	2.00	0.00	0.66	0.00	20.01	110.53	2.00	0.00	0.66	0.00
20.18	114.90	2.00	0.00	0.66	0.00	20.34	120.22	2.00	0.00	0.66	0.00
20.51	124.78	2.00	0.00	0.65	0.00	20.67	127.78	2.00	0.00	0.65	0.00
20.83	127.84	2.00	0.00	0.65	0.00	21.00	126.94	2.00	0.00	0.64	0.00
21.16	126.09	2.00	0.00	0.64	0.00	21.33	126.68	2.00	0.00	0.64	0.00
21.49	127.37	2.00	0.00	0.64	0.00	21.65	127.36	2.00	0.00	0.63	0.00
21.82	125.71	2.00	0.00	0.63	0.00	21.98	122.32	2.00	0.00	0.63	0.00
22.15	118.28	2.00	0.00	0.62	0.00	22.31	115.52	2.00	0.00	0.62	0.00
22.47	113.24	2.00	0.00	0.62	0.00	22.64	109.92	2.00	0.00	0.62	0.00
22.80	105.26	2.00	0.00	0.61	0.00	22.97	101.63	2.00	0.00	0.61	0.00
23.13	100.26	2.00	0.00	0.61	0.00	23.29	100.64	2.00	0.00	0.61	0.00
23.46	101.45	2.00	0.00	0.60	0.00	23.62	102.41	2.00	0.00	0.60	0.00
23.79	103.83	2.00	0.00	0.60	0.00	23.95	105.79	2.00	0.00	0.59	0.00
24.11	107.97	2.00	0.00	0.59	0.00	24.28	110.66	2.00	0.00	0.59	0.00
24.44	112.51	2.00	0.00	0.59	0.00	24.61	114.17	2.00	0.00	0.58	0.00
24.77	114.76	2.00	0.00	0.58	0.00	24.93	114.69	2.00	0.00	0.58	0.00
25.10	113.69	2.00	0.00	0.57	0.00	25.26	110.72	2.00	0.00	0.57	0.00
25.43	106.05	2.00	0.00	0.57	0.00	25.59	100.63	2.00	0.00	0.57	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
25.76	94.82	2.00	0.00	0.56	0.00	25.92	91.54	2.00	0.00	0.56	0.00
26.08	88.58	2.00	0.00	0.56	0.00	26.25	87.34	2.00	0.00	0.56	0.00
26.41	89.81	2.00	0.00	0.55	0.00	26.58	101.52	2.00	0.00	0.55	0.00
26.74	112.74	0.47	1.16	0.55	0.02	26.90	120.22	0.53	1.09	0.54	0.02
27.07	118.92	2.00	0.00	0.54	0.00	27.23	116.22	2.00	0.00	0.54	0.00
27.40	115.23	2.00	0.00	0.54	0.00	27.56	115.23	2.00	0.00	0.53	0.00
27.72	116.74	2.00	0.00	0.53	0.00	27.89	112.49	2.00	0.00	0.53	0.00
28.05	104.14	2.00	0.00	0.52	0.00	28.22	89.55	2.00	0.00	0.52	0.00
28.38	78.56	2.00	0.00	0.52	0.00	28.54	75.87	2.00	0.00	0.52	0.00
28.71	81.02	2.00	0.00	0.51	0.00	28.87	88.92	2.00	0.00	0.51	0.00
29.04	93.25	2.00	0.00	0.51	0.00	29.20	91.53	2.00	0.00	0.51	0.00
29.36	88.90	2.00	0.00	0.50	0.00	29.53	89.70	2.00	0.00	0.50	0.00
29.69	94.61	2.00	0.00	0.50	0.00	29.86	96.21	2.00	0.00	0.49	0.00
30.02	93.19	2.00	0.00	0.49	0.00	30.18	85.58	2.00	0.00	0.49	0.00
30.35	81.75	2.00	0.00	0.49	0.00	30.51	82.34	2.00	0.00	0.48	0.00
30.68	83.87	2.00	0.00	0.48	0.00	30.84	86.34	2.00	0.00	0.48	0.00
31.00	87.20	2.00	0.00	0.47	0.00	31.17	87.97	2.00	0.00	0.47	0.00
31.33	87.51	2.00	0.00	0.47	0.00	31.50	89.45	2.00	0.00	0.47	0.00
31.66	90.58	2.00	0.00	0.46	0.00	31.82	89.34	2.00	0.00	0.46	0.00
31.99	84.21	2.00	0.00	0.46	0.00	32.15	79.64	2.00	0.00	0.46	0.00
32.32	75.55	2.00	0.00	0.45	0.00	32.48	73.94	2.00	0.00	0.45	0.00
32.64	74.68	2.00	0.00	0.45	0.00	32.81	76.57	2.00	0.00	0.44	0.00
32.97	77.32	2.00	0.00	0.44	0.00	33.14	76.25	2.00	0.00	0.44	0.00
33.30	79.31	2.00	0.00	0.44	0.00	33.47	89.16	2.00	0.00	0.43	0.00
33.63	96.53	2.00	0.00	0.43	0.00	33.79	98.50	2.00	0.00	0.43	0.00
33.96	95.05	2.00	0.00	0.42	0.00	34.12	95.73	2.00	0.00	0.42	0.00
34.28	98.98	2.00	0.00	0.42	0.00	34.45	104.00	2.00	0.00	0.42	0.00
34.61	104.13	2.00	0.00	0.41	0.00	34.78	102.07	2.00	0.00	0.41	0.00
34.94	97.74	2.00	0.00	0.41	0.00	35.11	94.57	2.00	0.00	0.41	0.00
35.27	93.66	2.00	0.00	0.40	0.00	35.43	95.04	2.00	0.00	0.40	0.00
35.60	97.77	2.00	0.00	0.40	0.00	35.76	97.76	2.00	0.00	0.39	0.00
35.93	94.88	2.00	0.00	0.39	0.00	36.09	92.63	2.00	0.00	0.39	0.00
36.25	95.00	2.00	0.00	0.39	0.00	36.42	107.99	0.41	0.84	0.38	0.02
36.58	113.33	0.45	0.80	0.38	0.02	36.75	112.40	2.00	0.00	0.38	0.00
36.91	100.00	2.00	0.00	0.37	0.00	37.07	89.14	2.00	0.00	0.37	0.00
37.24	82.41	2.00	0.00	0.37	0.00	37.40	76.89	2.00	0.00	0.37	0.00
37.57	74.43	2.00	0.00	0.36	0.00	37.73	72.15	2.00	0.00	0.36	0.00
37.89	72.20	2.00	0.00	0.36	0.00	38.06	72.85	2.00	0.00	0.35	0.00
38.22	74.99	2.00	0.00	0.35	0.00	38.39	77.50	2.00	0.00	0.35	0.00
38.55	79.08	2.00	0.00	0.35	0.00	38.71	78.38	2.00	0.00	0.34	0.00
38.88	78.29	2.00	0.00	0.34	0.00	39.04	78.98	2.00	0.00	0.34	0.00
39.21	78.12	2.00	0.00	0.34	0.00	39.37	76.75	2.00	0.00	0.33	0.00
39.53	77.30	2.00	0.00	0.33	0.00	39.70	77.49	2.00	0.00	0.33	0.00
39.86	77.24	2.00	0.00	0.32	0.00	40.03	75.18	2.00	0.00	0.32	0.00
40.19	76.22	2.00	0.00	0.32	0.00	40.35	76.37	2.00	0.00	0.32	0.00
40.52	78.10	2.00	0.00	0.31	0.00	40.68	85.94	2.00	0.00	0.31	0.00
40.85	95.10	2.00	0.00	0.31	0.00	41.01	96.41	2.00	0.00	0.30	0.00
41.18	97.18	0.34	0.72	0.30	0.01	41.34	97.60	2.00	0.00	0.30	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
41.50	106.75	2.00	0.00	0.30	0.00	41.67	114.49	2.00	0.00	0.29	0.00
41.83	120.77	2.00	0.00	0.29	0.00	42.00	116.20	2.00	0.00	0.29	0.00
42.16	109.48	0.42	0.62	0.29	0.01	42.32	101.85	0.37	0.65	0.28	0.01
42.49	97.32	2.00	0.00	0.28	0.00	42.65	89.07	2.00	0.00	0.28	0.00
42.82	86.12	2.00	0.00	0.27	0.00	42.98	94.71	2.00	0.00	0.27	0.00
43.14	107.89	2.00	0.00	0.27	0.00	43.31	113.21	2.00	0.00	0.27	0.00
43.47	110.73	2.00	0.00	0.26	0.00	43.64	101.41	2.00	0.00	0.26	0.00
43.80	94.27	2.00	0.00	0.26	0.00	43.96	92.98	2.00	0.00	0.25	0.00
44.13	95.84	2.00	0.00	0.25	0.00	44.29	97.98	2.00	0.00	0.25	0.00
44.46	96.76	2.00	0.00	0.25	0.00	44.62	95.76	2.00	0.00	0.24	0.00
44.78	95.67	2.00	0.00	0.24	0.00	44.95	97.09	2.00	0.00	0.24	0.00
45.11	97.46	2.00	0.00	0.24	0.00	45.28	96.85	2.00	0.00	0.23	0.00
45.44	94.97	2.00	0.00	0.23	0.00	45.60	92.90	2.00	0.00	0.23	0.00
45.77	91.04	2.00	0.00	0.22	0.00	45.93	92.38	2.00	0.00	0.22	0.00
46.10	103.79	2.00	0.00	0.22	0.00	46.26	117.44	2.00	0.00	0.22	0.00
46.42	130.97	0.61	0.40	0.21	0.01	46.59	135.97	0.66	0.33	0.21	0.01
46.75	133.32	0.63	0.38	0.21	0.01	46.92	119.39	2.00	0.00	0.20	0.00
47.08	105.14	2.00	0.00	0.20	0.00	47.24	100.66	2.00	0.00	0.20	0.00
47.41	109.20	2.00	0.00	0.20	0.00	47.57	116.56	2.00	0.00	0.19	0.00
47.74	125.32	2.00	0.00	0.19	0.00	47.90	126.09	2.00	0.00	0.19	0.00
48.06	132.92	2.00	0.00	0.19	0.00	48.23	137.26	2.00	0.00	0.18	0.00
48.39	140.09	2.00	0.00	0.18	0.00	48.56	132.40	2.00	0.00	0.18	0.00
48.72	116.43	2.00	0.00	0.17	0.00	48.89	102.91	2.00	0.00	0.17	0.00
49.05	105.03	2.00	0.00	0.17	0.00	49.21	116.49	2.00	0.00	0.17	0.00
49.38	124.45	2.00	0.00	0.16	0.00	49.54	119.71	2.00	0.00	0.16	0.00
49.71	116.46	2.00	0.00	0.16	0.00	49.87	92.86	2.00	0.00	0.15	0.00
50.03	72.14	2.00	0.00	0.15	0.00	50.20	-1.00	2.00	0.00	0.15	0.00

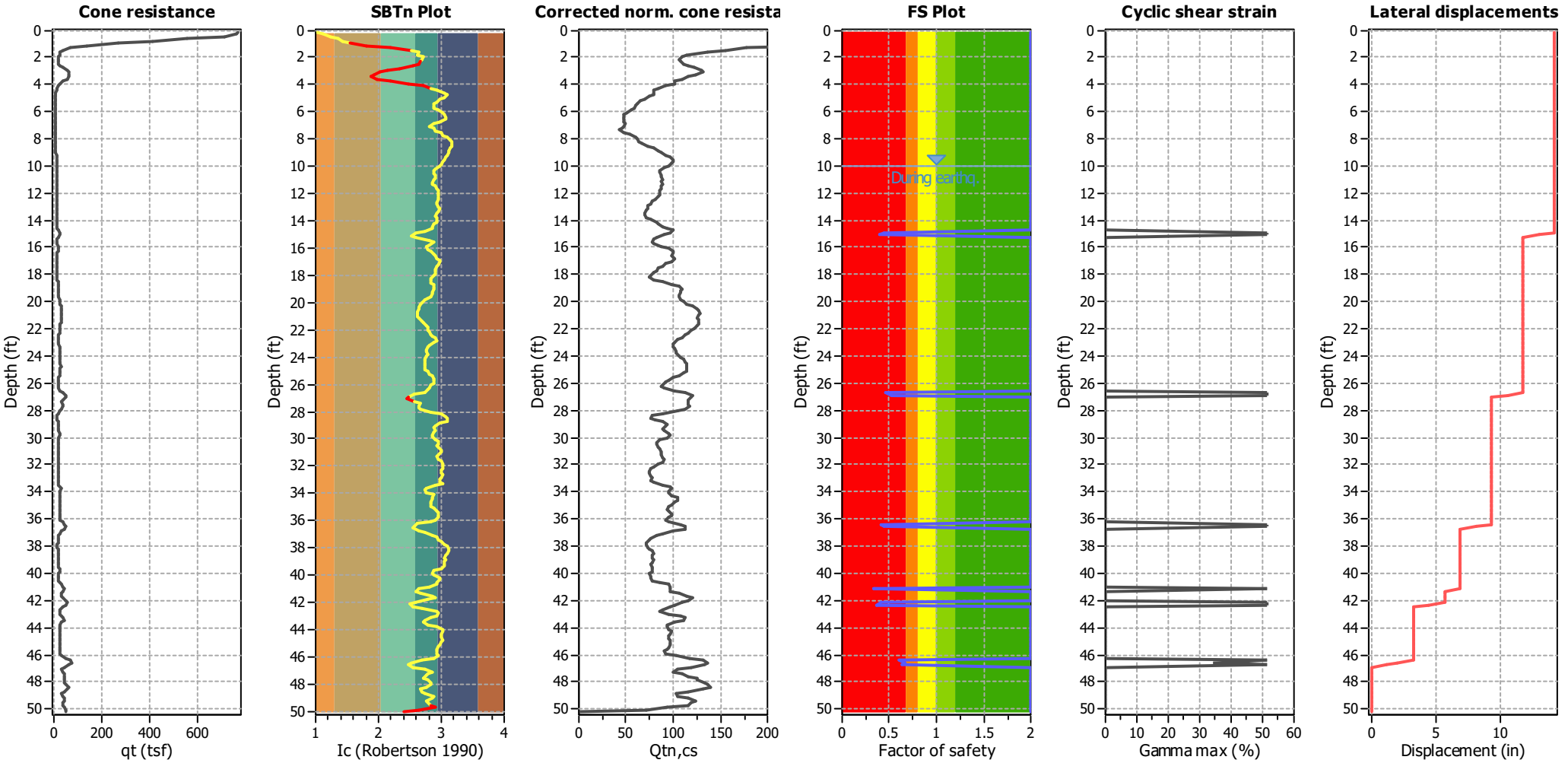
Total estimated settlement: 0.21

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Estimation of post-earthquake lateral Displacements

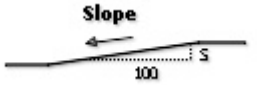
Geometric parameters: Gently sloping ground without free face (Slope 1.00 %)



Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$Q_{tn,cs}$: Equivalent clean sand normalized CPT total cone resistance
F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

Surface condition



:: Lateral displacement index calculation ::

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
10.01	9.73	14.75	4.01	94.89	2.00	3.83	0.00	0.00
10.17	10.19	15.48	3.46	90.48	2.00	5.41	0.00	0.00
10.34	10.21	15.50	3.13	86.50	2.00	5.46	0.00	0.00
10.50	10.05	15.23	3.06	85.13	2.00	4.89	0.00	0.00
10.66	9.91	14.99	3.23	86.69	2.00	4.36	0.00	0.00
10.83	10.25	15.52	3.19	87.41	2.00	5.51	0.00	0.00
10.99	10.73	16.28	3.13	88.25	2.00	7.08	0.00	0.00
11.16	10.99	16.68	3.00	87.41	2.00	7.88	0.00	0.00
11.32	10.96	16.62	3.09	88.45	2.00	7.76	0.00	0.00
11.48	10.25	15.46	3.23	87.86	2.00	5.38	0.00	0.00
11.65	9.62	14.43	3.35	87.11	2.00	3.11	0.00	0.00
11.81	9.11	13.61	3.43	86.03	2.00	1.16	0.00	0.00
11.98	9.35	13.97	3.28	85.29	2.00	2.03	0.00	0.00
12.14	9.27	13.83	3.31	85.28	2.00	1.71	0.00	0.00
12.30	8.97	13.33	3.26	83.58	2.00	0.50	0.00	0.00
12.47	8.79	13.03	3.13	81.48	2.00	0.00	0.00	0.00
12.63	8.72	12.91	2.88	78.36	2.00	0.00	0.00	0.00
12.80	8.55	12.62	2.73	75.98	2.00	0.00	0.00	0.00
12.96	8.05	11.79	2.68	73.55	2.00	0.00	0.00	0.00
13.12	7.76	11.32	2.68	72.49	2.00	0.00	0.00	0.00
13.29	7.94	11.57	2.53	71.37	2.00	0.00	0.00	0.00
13.45	8.19	11.85	2.40	70.33	2.00	0.00	0.00	0.00
13.62	8.37	12.02	2.30	69.45	2.00	0.00	0.00	0.00
13.78	8.50	12.17	2.48	72.09	2.00	0.00	0.00	0.00
13.94	8.89	12.73	2.76	76.67	2.00	0.00	0.00	0.00
14.11	9.54	13.65	3.02	81.89	2.00	1.28	0.00	0.00
14.27	11.01	15.65	2.90	84.56	2.00	5.78	0.00	0.00
14.44	11.73	16.61	3.06	88.47	2.00	7.75	0.00	0.00
14.60	12.83	18.12	3.25	94.07	2.00	10.62	0.00	0.00
14.76	16.61	23.19	3.02	99.55	2.00	18.77	0.00	0.00
14.93	21.90	29.92	2.40	97.12	0.44	27.17	51.20	1.21
15.09	22.90	30.86	2.06	91.02	0.40	28.20	51.20	1.21
15.26	18.33	24.66	1.98	82.66	2.00	20.79	0.00	0.00
15.42	12.22	16.51	2.40	79.04	2.00	7.55	0.00	0.00
15.58	10.61	14.27	2.55	77.26	2.00	2.73	0.00	0.00
15.75	12.16	16.26	2.43	79.09	2.00	7.05	0.00	0.00
15.91	14.45	19.29	2.60	86.73	2.00	12.68	0.00	0.00
16.08	15.52	20.72	2.99	95.08	2.00	15.05	0.00	0.00
16.24	14.63	19.54	3.51	100.57	2.00	13.12	0.00	0.00
16.40	13.45	17.88	3.66	99.28	2.00	10.18	0.00	0.00
16.57	12.73	16.84	3.79	98.60	2.00	8.21	0.00	0.00
16.73	12.56	16.53	3.94	99.67	2.00	7.59	0.00	0.00
16.90	12.07	15.82	4.20	100.90	2.00	6.13	0.00	0.00
17.06	11.57	15.03	4.16	98.48	2.00	4.45	0.00	0.00
17.22	11.56	14.87	3.69	92.83	2.00	4.10	0.00	0.00
17.39	11.79	15.02	3.27	88.19	2.00	4.44	0.00	0.00
17.55	11.81	14.92	3.01	84.76	2.00	4.20	0.00	0.00
17.72	11.33	14.20	2.99	83.02	2.00	2.57	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
17.88	11.04	13.72	2.80	79.66	2.00	1.43	0.00	0.00
18.05	11.33	13.97	2.51	76.32	2.00	2.03	0.00	0.00
18.21	12.29	15.06	2.28	75.08	2.00	4.51	0.00	0.00
18.37	13.05	15.98	2.49	79.74	2.00	6.48	0.00	0.00
18.54	13.95	17.13	2.95	88.36	2.00	8.76	0.00	0.00
18.70	14.69	18.08	3.59	98.89	2.00	10.55	0.00	0.00
18.87	15.64	19.23	3.94	105.94	2.00	12.58	0.00	0.00
19.03	16.41	20.11	4.04	109.19	2.00	14.06	0.00	0.00
19.19	16.71	20.35	3.95	108.53	2.00	14.45	0.00	0.00
19.36	17.10	20.70	3.83	107.57	2.00	15.01	0.00	0.00
19.52	17.73	21.33	3.68	106.80	2.00	16.00	0.00	0.00
19.69	19.30	23.08	3.47	106.80	2.00	18.60	0.00	0.00
19.85	21.33	25.36	3.28	107.64	2.00	21.71	0.00	0.00
20.01	23.87	28.24	3.20	110.53	2.00	25.26	0.00	0.00
20.18	26.17	30.83	3.23	114.90	2.00	28.16	0.00	0.00
20.34	28.23	33.12	3.34	120.22	2.00	30.53	0.00	0.00
20.51	30.08	35.14	3.43	124.78	2.00	32.48	0.00	0.00
20.67	31.44	36.56	3.48	127.78	2.00	33.79	0.00	0.00
20.83	32.19	37.23	3.44	127.84	2.00	34.39	0.00	0.00
21.00	31.43	36.17	3.46	126.94	2.00	33.43	0.00	0.00
21.16	30.03	34.39	3.55	126.09	2.00	31.77	0.00	0.00
21.33	28.34	32.32	3.74	126.68	2.00	29.72	0.00	0.00
21.49	26.79	30.41	3.95	127.37	2.00	27.71	0.00	0.00
21.65	25.40	28.70	4.13	127.36	2.00	25.80	0.00	0.00
21.82	24.05	27.01	4.22	125.71	2.00	23.80	0.00	0.00
21.98	23.09	25.76	4.15	122.32	2.00	22.24	0.00	0.00
22.15	22.29	24.69	4.02	118.28	2.00	20.84	0.00	0.00
22.31	21.06	23.17	4.03	115.52	2.00	18.74	0.00	0.00
22.47	19.26	21.03	4.18	113.24	2.00	15.54	0.00	0.00
22.64	17.42	18.86	4.30	109.92	2.00	11.94	0.00	0.00
22.80	16.70	17.93	4.09	105.26	2.00	10.27	0.00	0.00
22.97	17.31	18.47	3.71	101.63	2.00	11.26	0.00	0.00
23.13	18.98	20.20	3.37	100.26	2.00	14.21	0.00	0.00
23.29	20.61	21.88	3.19	100.64	2.00	16.84	0.00	0.00
23.46	21.41	22.65	3.16	101.45	2.00	17.98	0.00	0.00
23.62	21.41	22.55	3.23	102.41	2.00	17.84	0.00	0.00
23.79	21.50	22.55	3.32	103.83	2.00	17.84	0.00	0.00
23.95	22.29	23.30	3.36	105.79	2.00	18.92	0.00	0.00
24.11	23.83	24.85	3.34	107.97	2.00	21.04	0.00	0.00
24.28	24.91	25.89	3.40	110.66	2.00	22.40	0.00	0.00
24.44	25.42	26.33	3.47	112.51	2.00	22.95	0.00	0.00
24.61	26.00	26.82	3.52	114.17	2.00	23.56	0.00	0.00
24.77	26.31	27.02	3.53	114.76	2.00	23.81	0.00	0.00
24.93	25.81	26.37	3.59	114.69	2.00	23.01	0.00	0.00
25.10	24.17	24.52	3.73	113.69	2.00	20.61	0.00	0.00
25.26	22.16	22.30	3.80	110.72	2.00	17.47	0.00	0.00
25.43	20.42	20.35	3.74	106.05	2.00	14.46	0.00	0.00
25.59	18.57	18.31	3.65	100.63	2.00	10.96	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
25.76	17.91	17.52	3.34	94.82	2.00	9.51	0.00	0.00
25.92	17.28	16.77	3.20	91.54	2.00	8.06	0.00	0.00
26.08	17.74	17.15	2.93	88.58	2.00	8.80	0.00	0.00
26.25	18.33	17.67	2.78	87.34	2.00	9.79	0.00	0.00
26.41	19.62	18.92	2.80	89.81	2.00	12.04	0.00	0.00
26.58	23.90	23.23	3.10	101.52	2.00	18.81	0.00	0.00
26.74	36.99	36.36	2.75	112.74	0.47	33.60	51.20	1.21
26.90	45.51	44.76	2.67	120.22	0.53	40.47	51.20	1.21
27.07	46.85	45.89	2.57	118.92	2.00	41.29	0.00	0.00
27.23	37.13	36.05	2.93	116.22	2.00	33.32	0.00	0.00
27.40	31.70	30.49	3.25	115.23	2.00	27.80	0.00	0.00
27.56	33.13	31.78	3.16	115.23	2.00	29.16	0.00	0.00
27.72	34.28	32.78	3.17	116.74	2.00	30.18	0.00	0.00
27.89	30.98	29.37	3.19	112.49	2.00	26.56	0.00	0.00
28.05	22.14	20.52	3.58	104.14	2.00	14.73	0.00	0.00
28.22	14.88	13.26	3.70	89.55	2.00	0.31	0.00	0.00
28.38	11.97	10.31	3.42	78.56	2.00	0.00	0.00	0.00
28.54	11.34	9.64	3.35	75.87	2.00	0.00	0.00	0.00
28.71	12.20	10.44	3.65	81.02	2.00	0.00	0.00	0.00
28.87	15.83	13.95	3.48	88.92	2.00	1.99	0.00	0.00
29.04	18.43	16.41	3.38	93.25	2.00	7.34	0.00	0.00
29.20	19.06	16.94	3.17	91.53	2.00	8.40	0.00	0.00
29.36	17.73	15.58	3.18	88.90	2.00	5.64	0.00	0.00
29.53	18.47	16.23	3.14	89.70	2.00	6.98	0.00	0.00
29.69	20.58	18.18	3.21	94.61	2.00	10.72	0.00	0.00
29.86	20.66	18.17	3.33	96.21	2.00	10.71	0.00	0.00
30.02	18.79	16.31	3.39	93.19	2.00	7.15	0.00	0.00
30.18	16.28	13.86	3.21	85.58	2.00	1.77	0.00	0.00
30.35	15.45	13.02	3.05	81.75	2.00	0.00	0.00	0.00
30.51	16.12	13.59	2.99	82.34	2.00	1.12	0.00	0.00
30.68	16.34	13.73	3.09	83.87	2.00	1.47	0.00	0.00
30.84	15.54	12.93	3.48	86.34	2.00	0.00	0.00	0.00
31.00	15.55	12.88	3.57	87.20	2.00	0.00	0.00	0.00
31.17	16.68	13.87	3.41	87.97	2.00	1.79	0.00	0.00
31.33	17.60	14.66	3.22	87.51	2.00	3.62	0.00	0.00
31.50	17.42	14.43	3.42	89.45	2.00	3.10	0.00	0.00
31.66	16.28	13.31	3.77	90.58	2.00	0.45	0.00	0.00
31.82	15.86	12.87	3.77	89.34	2.00	0.00	0.00	0.00
31.99	15.08	12.10	3.47	84.21	2.00	0.00	0.00	0.00
32.15	14.51	11.53	3.18	79.64	2.00	0.00	0.00	0.00
32.32	14.22	11.22	2.87	75.55	2.00	0.00	0.00	0.00
32.48	13.79	10.79	2.82	73.94	2.00	0.00	0.00	0.00
32.64	13.84	10.79	2.89	74.68	2.00	0.00	0.00	0.00
32.81	14.69	11.50	2.90	76.57	2.00	0.00	0.00	0.00
32.97	15.25	11.95	2.87	77.32	2.00	0.00	0.00	0.00
33.14	15.22	11.88	2.79	76.25	2.00	0.00	0.00	0.00
33.30	14.85	11.50	3.15	79.31	2.00	0.00	0.00	0.00
33.47	19.76	15.81	3.15	89.16	2.00	6.12	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
33.63	26.10	21.39	2.95	96.53	2.00	16.10	0.00	0.00
33.79	28.51	23.46	2.88	98.50	2.00	19.15	0.00	0.00
33.96	25.70	20.88	2.91	95.05	2.00	15.29	0.00	0.00
34.12	22.03	17.53	3.38	95.73	2.00	9.52	0.00	0.00
34.28	23.31	18.57	3.46	98.98	2.00	11.44	0.00	0.00
34.45	24.74	19.74	3.66	104.00	2.00	13.45	0.00	0.00
34.61	25.87	20.65	3.54	104.13	2.00	14.93	0.00	0.00
34.78	25.51	20.26	3.45	102.07	2.00	14.30	0.00	0.00
34.94	24.05	18.91	3.32	97.74	2.00	12.03	0.00	0.00
35.11	22.13	17.17	3.34	94.57	2.00	8.85	0.00	0.00
35.27	20.48	15.68	3.52	93.66	2.00	5.85	0.00	0.00
35.43	20.37	15.51	3.67	95.04	2.00	5.48	0.00	0.00
35.60	20.67	15.69	3.87	97.77	2.00	5.87	0.00	0.00
35.76	21.05	15.95	3.81	97.76	2.00	6.41	0.00	0.00
35.93	21.63	16.40	3.49	94.88	2.00	7.32	0.00	0.00
36.09	23.84	18.24	3.05	92.63	2.00	10.83	0.00	0.00
36.25	34.13	27.01	2.42	95.00	2.00	23.79	0.00	0.00
36.42	42.94	34.41	2.62	107.99	0.41	31.79	51.20	1.21
36.58	47.08	37.81	2.69	113.33	0.45	34.90	51.20	1.21
36.75	39.54	31.19	3.04	112.40	2.00	28.54	0.00	0.00
36.91	30.11	23.13	2.99	100.00	2.00	18.68	0.00	0.00
37.07	22.97	17.07	2.96	89.14	2.00	8.66	0.00	0.00
37.24	18.90	13.62	2.97	82.41	2.00	1.20	0.00	0.00
37.40	17.42	12.36	2.75	76.89	2.00	0.00	0.00	0.00
37.57	15.88	11.07	2.79	74.43	2.00	0.00	0.00	0.00
37.73	14.43	9.86	2.87	72.15	2.00	0.00	0.00	0.00
37.89	13.46	9.05	3.11	72.20	2.00	0.00	0.00	0.00
38.06	13.40	8.97	3.21	72.85	2.00	0.00	0.00	0.00
38.22	13.78	9.23	3.36	74.99	2.00	0.00	0.00	0.00
38.39	14.78	9.99	3.38	77.50	2.00	0.00	0.00	0.00
38.55	15.50	10.51	3.38	79.08	2.00	0.00	0.00	0.00
38.71	15.76	10.68	3.26	78.38	2.00	0.00	0.00	0.00
38.88	15.60	10.51	3.30	78.29	2.00	0.00	0.00	0.00
39.04	15.83	10.65	3.33	78.98	2.00	0.00	0.00	0.00
39.21	15.93	10.68	3.23	78.12	2.00	0.00	0.00	0.00
39.37	15.77	10.52	3.14	76.75	2.00	0.00	0.00	0.00
39.53	17.09	11.50	2.95	77.30	2.00	0.00	0.00	0.00
39.70	20.01	13.79	2.55	77.49	2.00	1.62	0.00	0.00
39.86	20.78	14.37	2.45	77.24	2.00	2.97	0.00	0.00
40.03	19.65	13.42	2.43	75.18	2.00	0.71	0.00	0.00
40.19	17.41	11.58	2.84	76.22	2.00	0.00	0.00	0.00
40.35	17.65	11.71	2.82	76.37	2.00	0.00	0.00	0.00
40.52	19.29	12.95	2.73	78.10	2.00	0.00	0.00	0.00
40.68	21.36	14.49	3.10	85.94	2.00	3.25	0.00	0.00
40.85	28.01	19.67	3.04	95.10	2.00	13.33	0.00	0.00
41.01	36.50	26.43	2.52	96.41	2.00	23.07	0.00	0.00
41.18	41.09	30.05	2.34	97.18	0.34	27.32	51.20	1.21
41.34	36.41	26.15	2.61	97.60	2.00	22.73	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
41.50	29.08	20.09	3.79	106.75	2.00	14.03	0.00	0.00
41.67	29.41	20.19	4.36	114.49	2.00	14.19	0.00	0.00
41.83	37.49	26.43	3.92	120.77	2.00	23.08	0.00	0.00
42.00	47.81	34.62	3.00	116.20	2.00	31.99	0.00	0.00
42.16	53.78	39.43	2.44	109.48	0.42	36.28	51.20	1.21
42.32	46.74	33.78	2.37	101.85	0.37	31.18	51.20	1.21
42.49	34.90	24.31	2.73	97.32	2.00	20.32	0.00	0.00
42.65	22.81	14.87	3.28	89.07	2.00	4.10	0.00	0.00
42.82	21.35	13.72	3.25	86.12	2.00	1.45	0.00	0.00
42.98	24.08	15.68	3.59	94.71	2.00	5.84	0.00	0.00
43.14	31.49	21.18	3.71	107.89	2.00	15.77	0.00	0.00
43.31	38.23	26.26	3.48	113.21	2.00	22.86	0.00	0.00
43.47	39.13	26.90	3.27	110.73	2.00	23.66	0.00	0.00
43.64	32.11	21.50	3.24	101.41	2.00	16.27	0.00	0.00
43.80	24.59	15.76	3.54	94.27	2.00	6.02	0.00	0.00
43.96	21.50	13.44	3.93	92.98	2.00	0.77	0.00	0.00
44.13	22.11	13.82	4.11	95.84	2.00	1.69	0.00	0.00
44.29	23.12	14.48	4.14	97.98	2.00	3.23	0.00	0.00
44.46	23.23	14.51	4.02	96.76	2.00	3.29	0.00	0.00
44.62	22.82	14.17	4.01	95.76	2.00	2.50	0.00	0.00
44.78	22.36	13.80	4.10	95.67	2.00	1.63	0.00	0.00
44.95	23.09	14.26	4.11	97.09	2.00	2.70	0.00	0.00
45.11	24.08	14.89	3.99	97.46	2.00	4.14	0.00	0.00
45.28	24.74	15.31	3.85	96.85	2.00	5.06	0.00	0.00
45.44	25.13	15.57	3.63	94.97	2.00	5.61	0.00	0.00
45.60	24.96	15.40	3.49	92.90	2.00	5.26	0.00	0.00
45.77	24.51	15.04	3.41	91.04	2.00	4.48	0.00	0.00
45.93	24.23	14.76	3.58	92.38	2.00	3.84	0.00	0.00
46.10	29.75	18.62	3.79	103.79	2.00	11.53	0.00	0.00
46.26	45.34	29.96	3.39	117.44	2.00	27.21	0.00	0.00
46.42	66.73	45.81	3.05	130.97	0.61	41.23	51.20	1.21
46.59	74.80	51.72	2.98	135.97	0.66	45.24	34.10	0.81
46.75	63.83	43.23	3.29	133.32	0.63	39.32	51.20	1.21
46.92	43.30	27.97	3.67	119.39	2.00	24.95	0.00	0.00
47.08	32.50	20.17	3.66	105.14	2.00	14.16	0.00	0.00
47.24	34.26	21.46	3.19	100.66	2.00	16.20	0.00	0.00
47.41	39.14	24.82	3.37	109.20	2.00	21.00	0.00	0.00
47.57	43.76	27.99	3.51	116.56	2.00	24.97	0.00	0.00
47.74	42.89	27.09	4.13	125.32	2.00	23.89	0.00	0.00
47.90	40.49	25.23	4.41	126.09	2.00	21.55	0.00	0.00
48.06	41.40	25.68	4.82	132.92	2.00	22.13	0.00	0.00
48.23	48.51	30.65	4.46	137.26	2.00	27.97	0.00	0.00
48.39	58.71	37.93	3.95	140.09	2.00	35.00	0.00	0.00
48.56	53.71	34.31	3.84	132.40	2.00	31.69	0.00	0.00
48.72	43.05	26.79	3.61	116.43	2.00	23.53	0.00	0.00
48.89	31.49	18.67	3.71	102.91	2.00	11.61	0.00	0.00
49.05	33.49	19.99	3.67	105.03	2.00	13.86	0.00	0.00
49.21	42.20	25.92	3.70	116.49	2.00	22.43	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
49.38	43.30	26.45	4.14	124.45	2.00	23.11	0.00	0.00
49.54	38.82	23.27	4.24	119.71	2.00	18.88	0.00	0.00
49.71	34.63	20.30	4.48	116.46	2.00	14.37	0.00	0.00
49.87	41.31	25.47	2.39	92.86	2.00	21.85	0.00	0.00
50.03	47.72	30.77	1.22	72.14	2.00	28.10	0.00	0.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

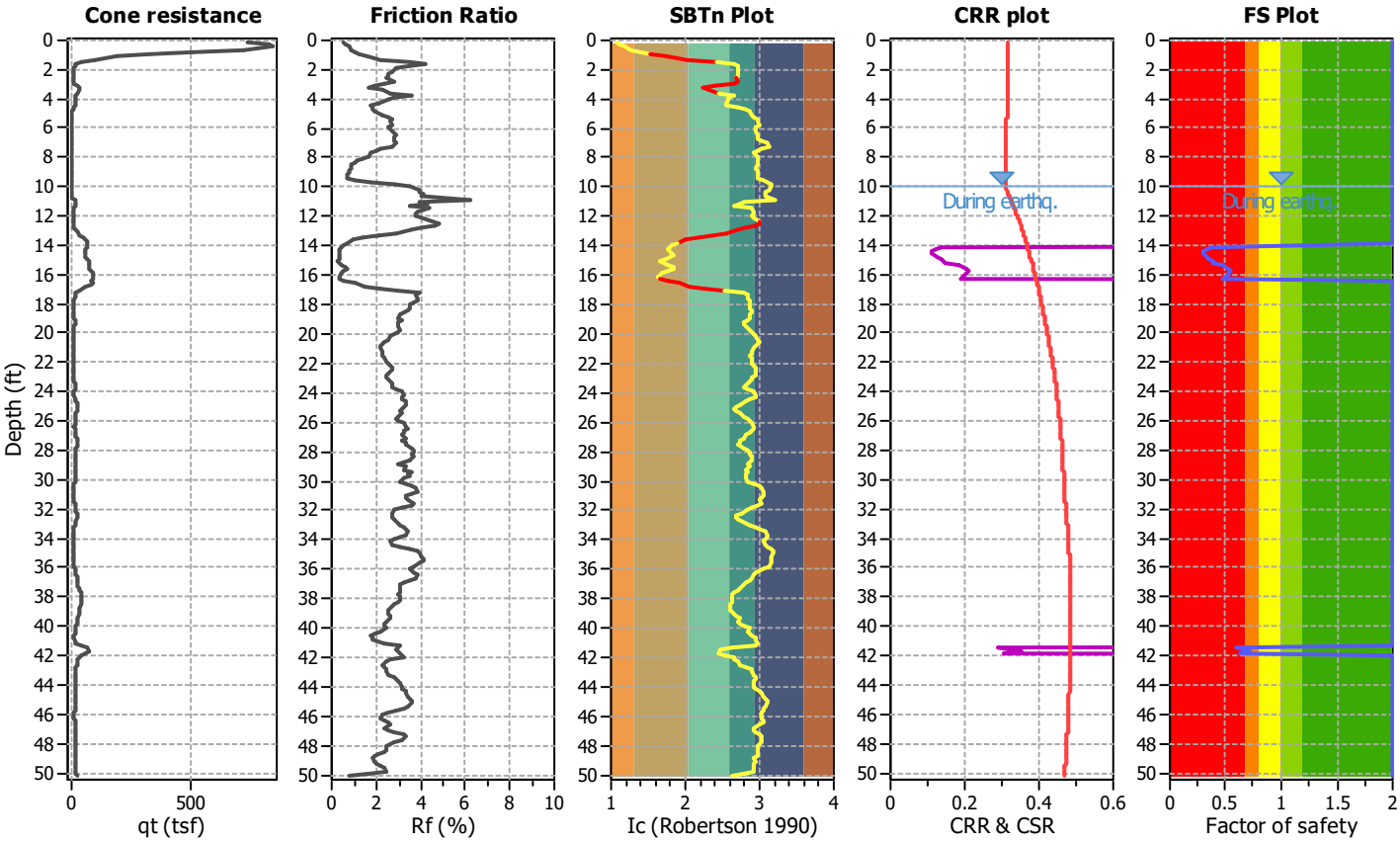
LIQUEFACTION ANALYSIS REPORT

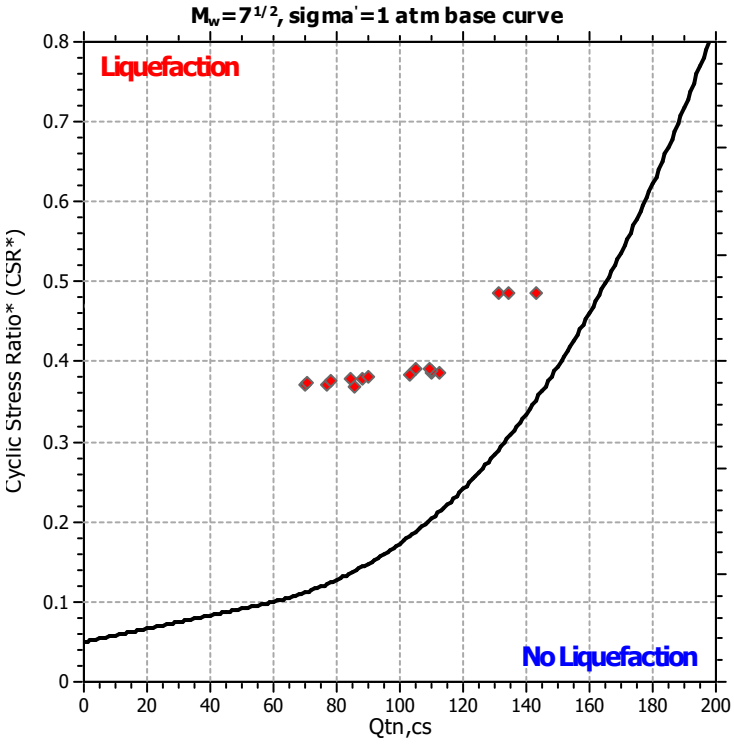
Project title : **Location :**

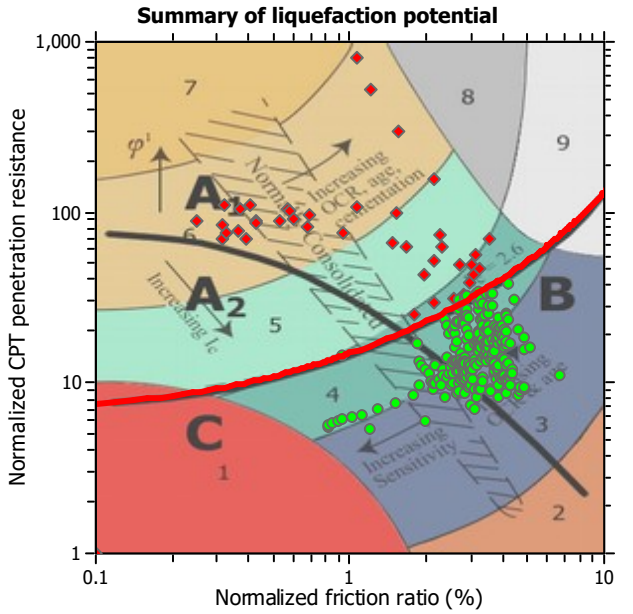
CPT file : CPT 2

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.56	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

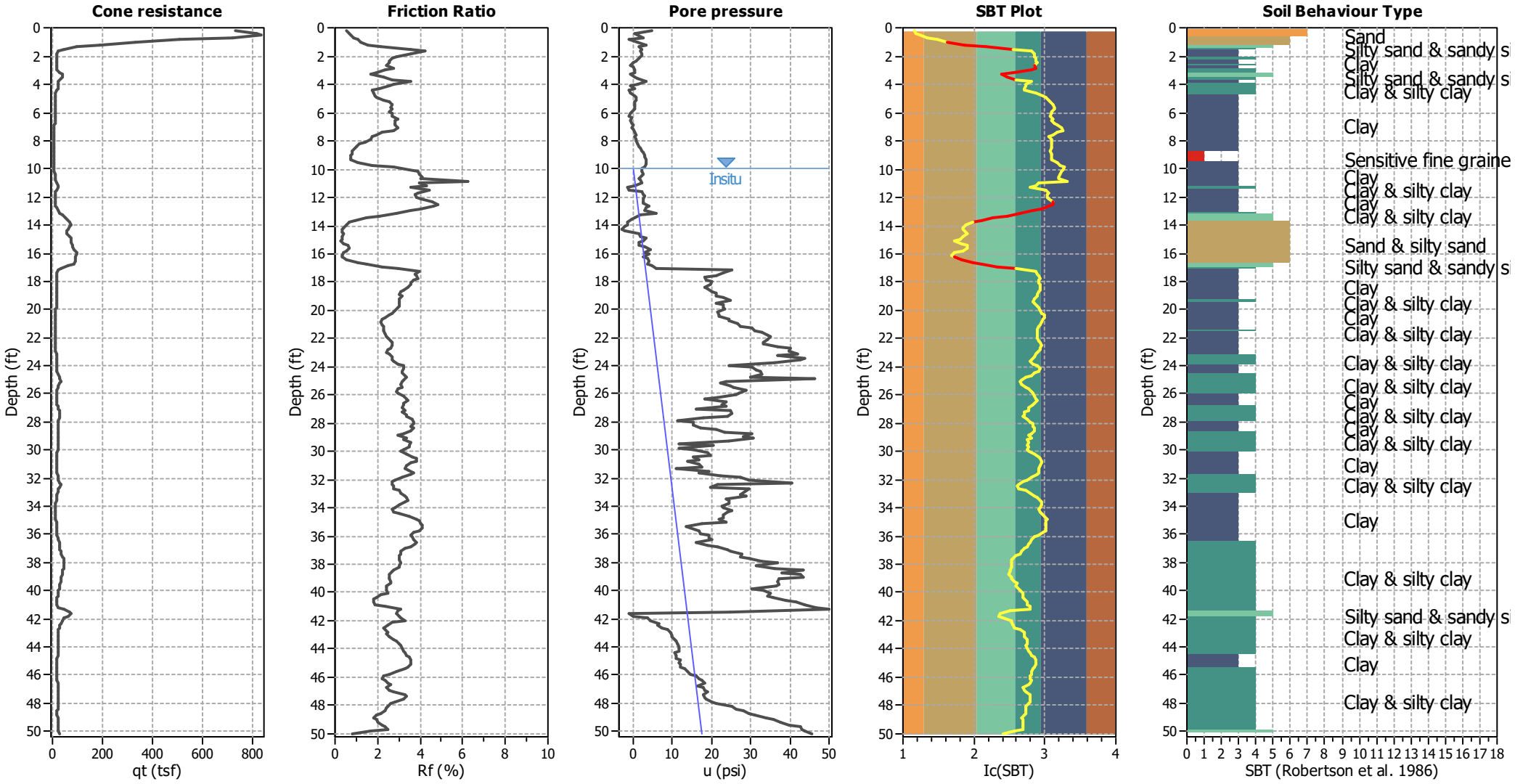






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



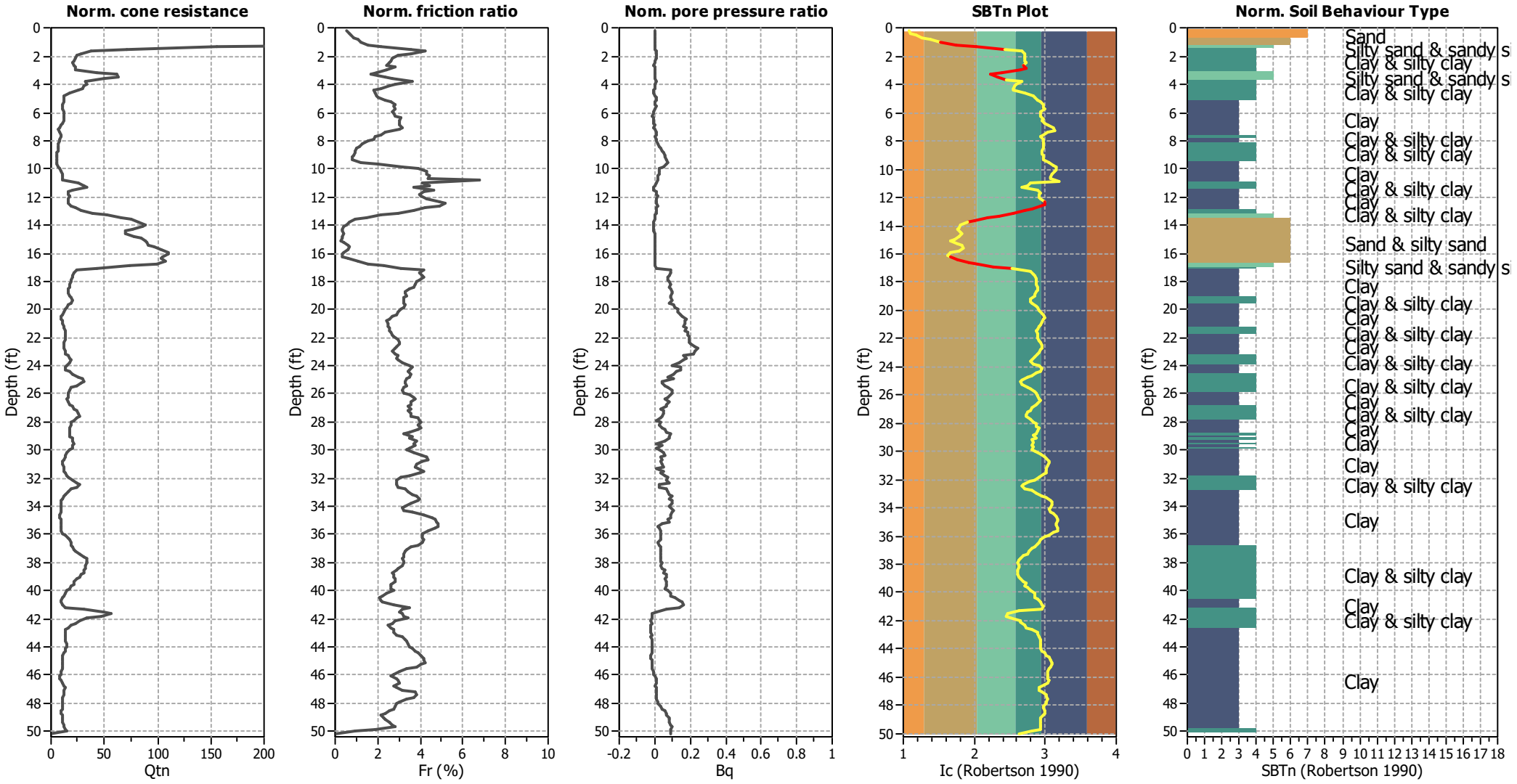
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



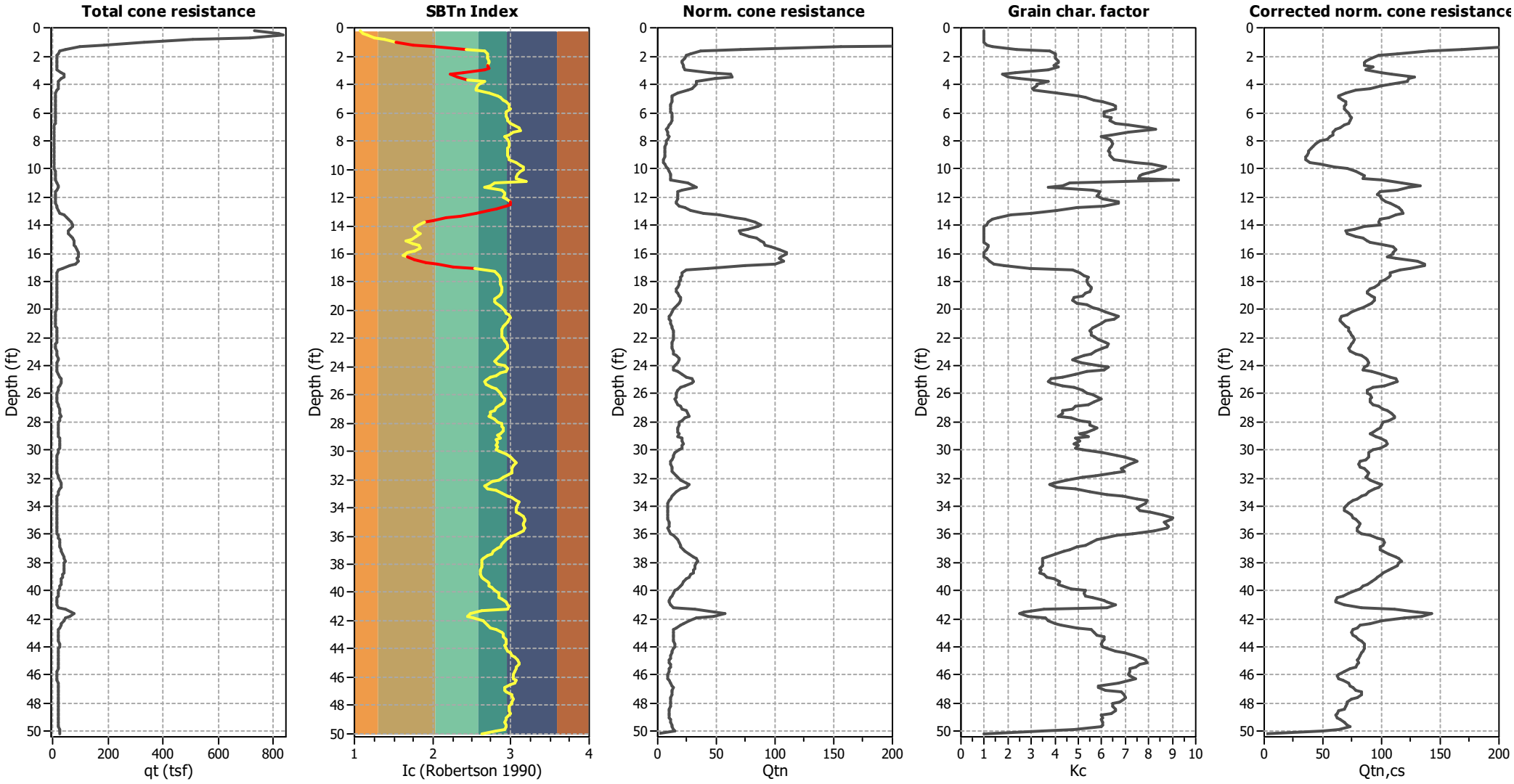
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

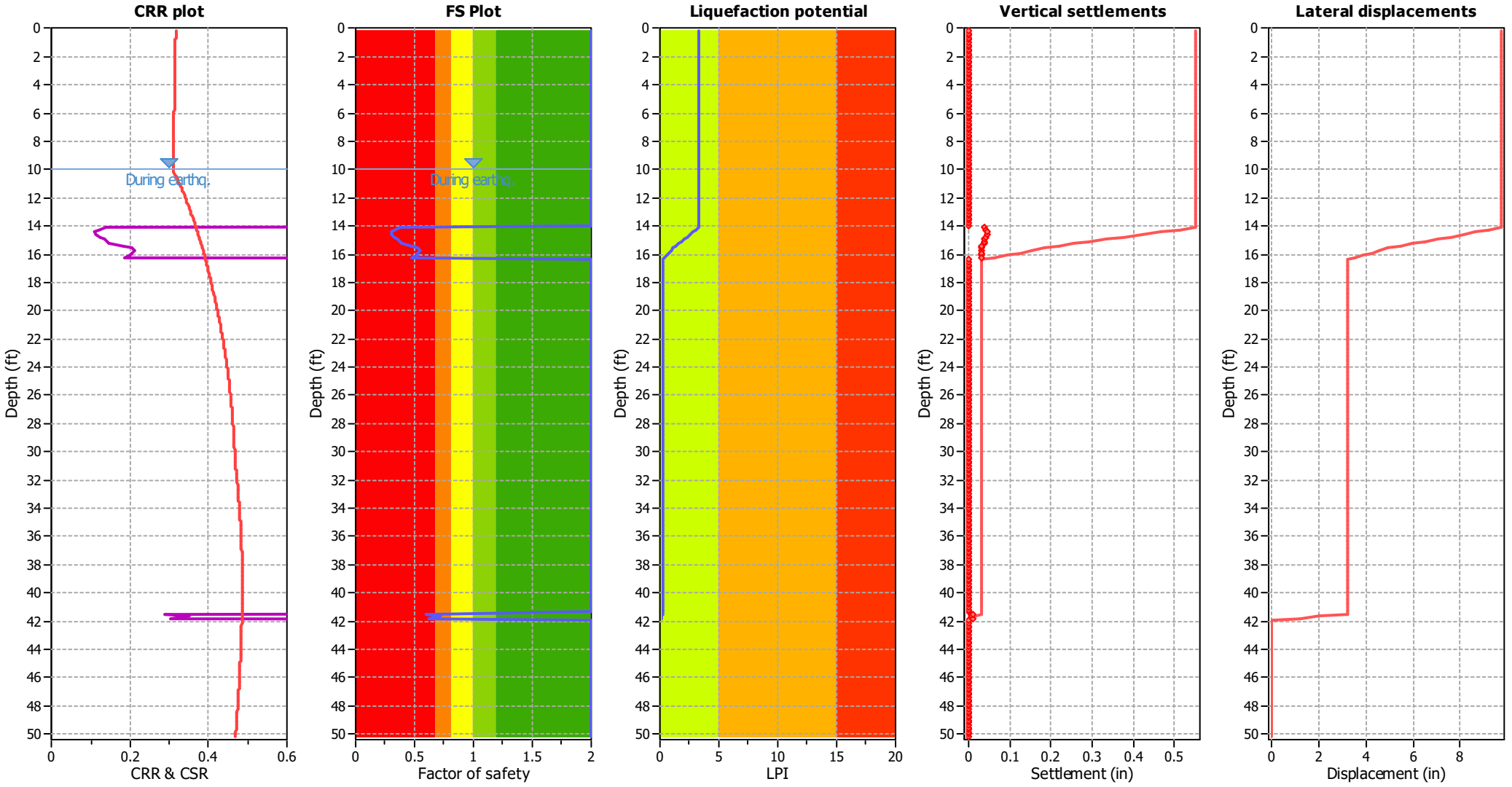
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

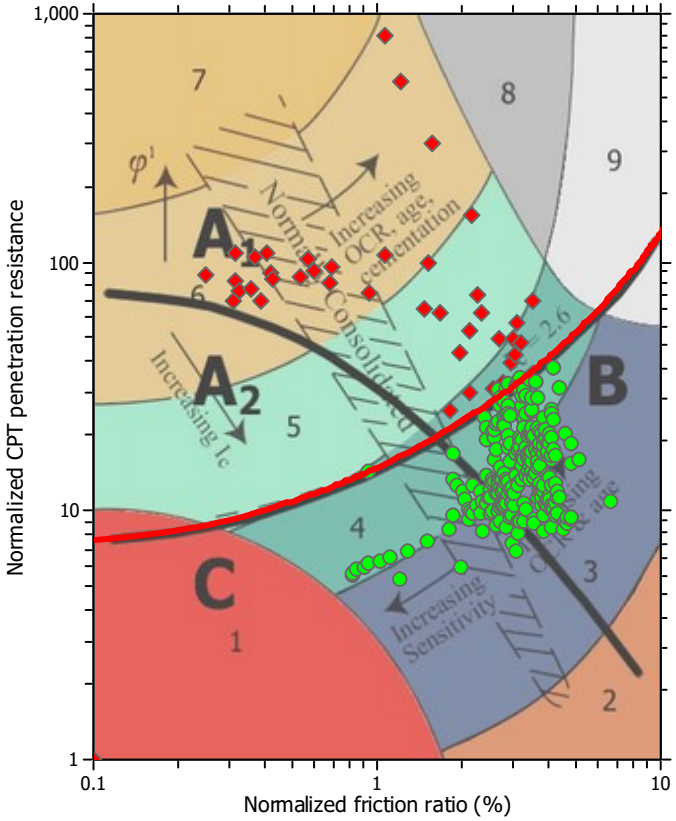
F.S. color scheme

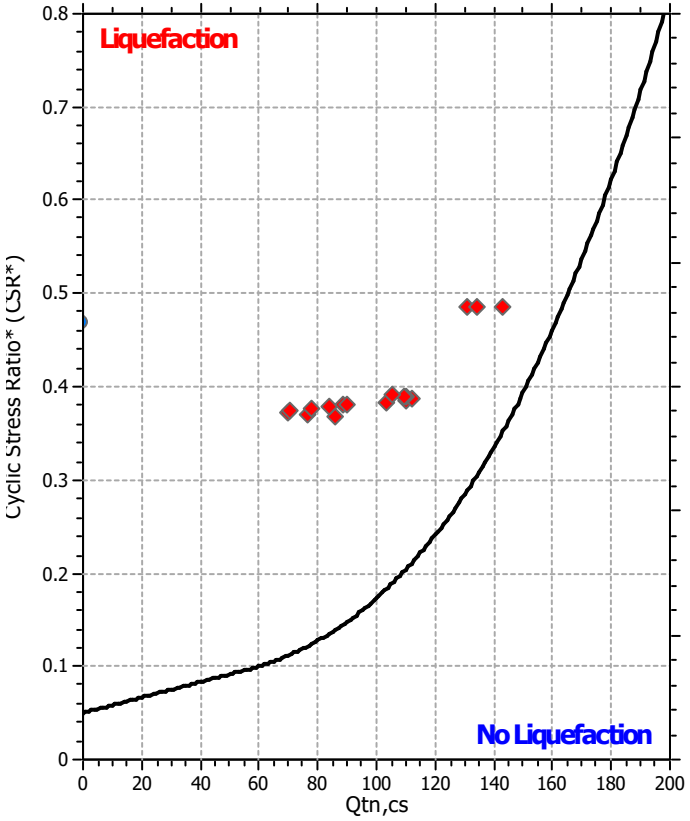
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

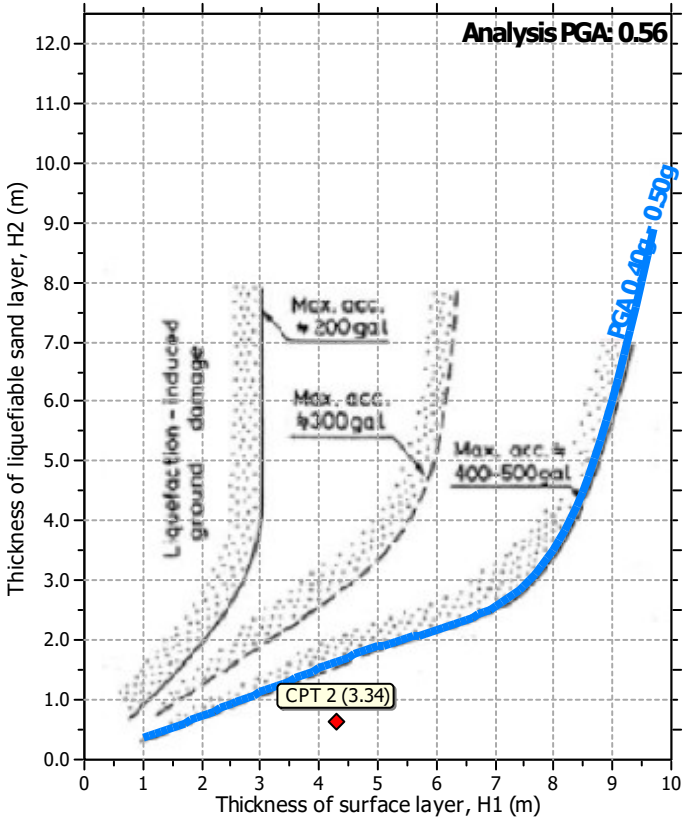
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



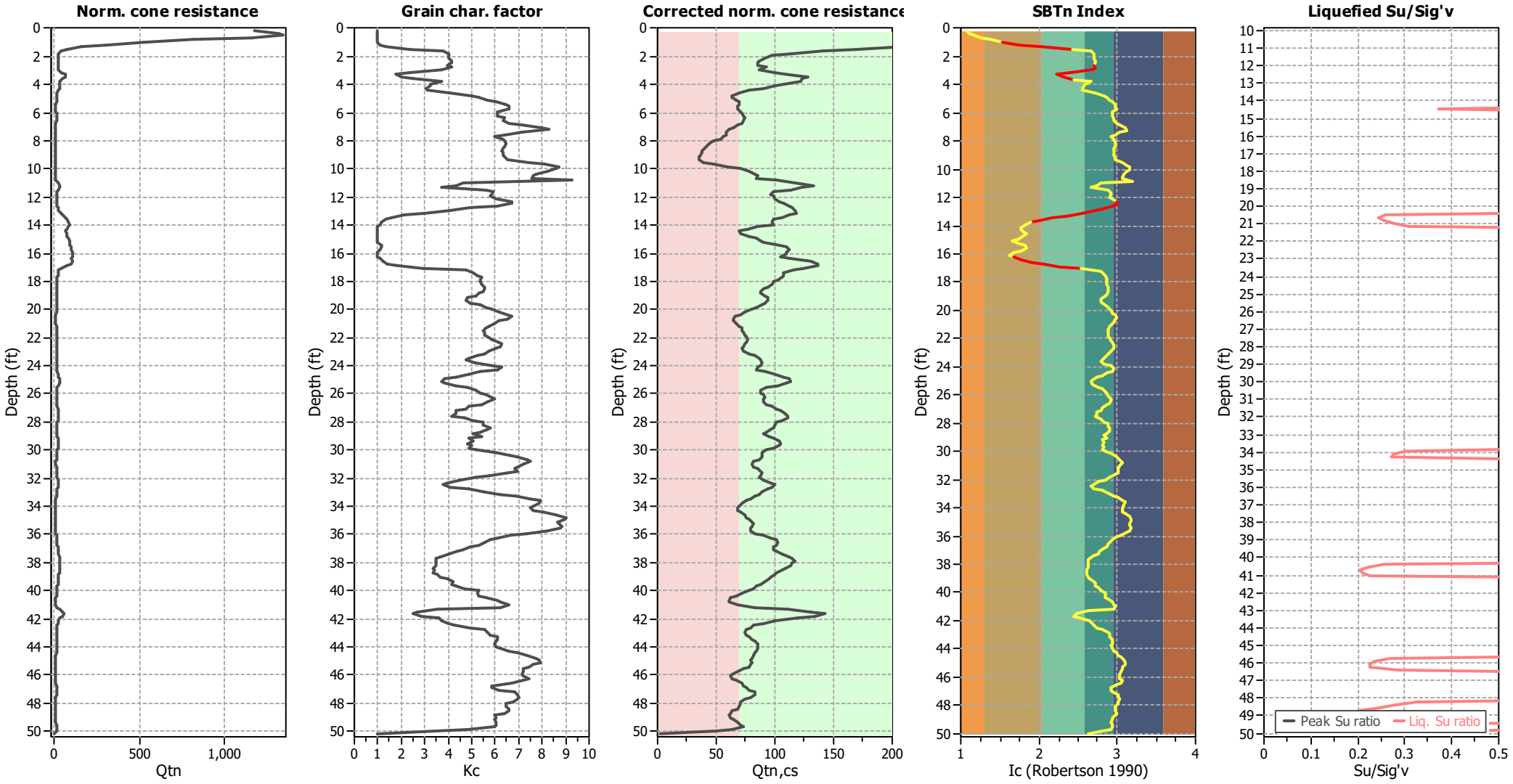




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

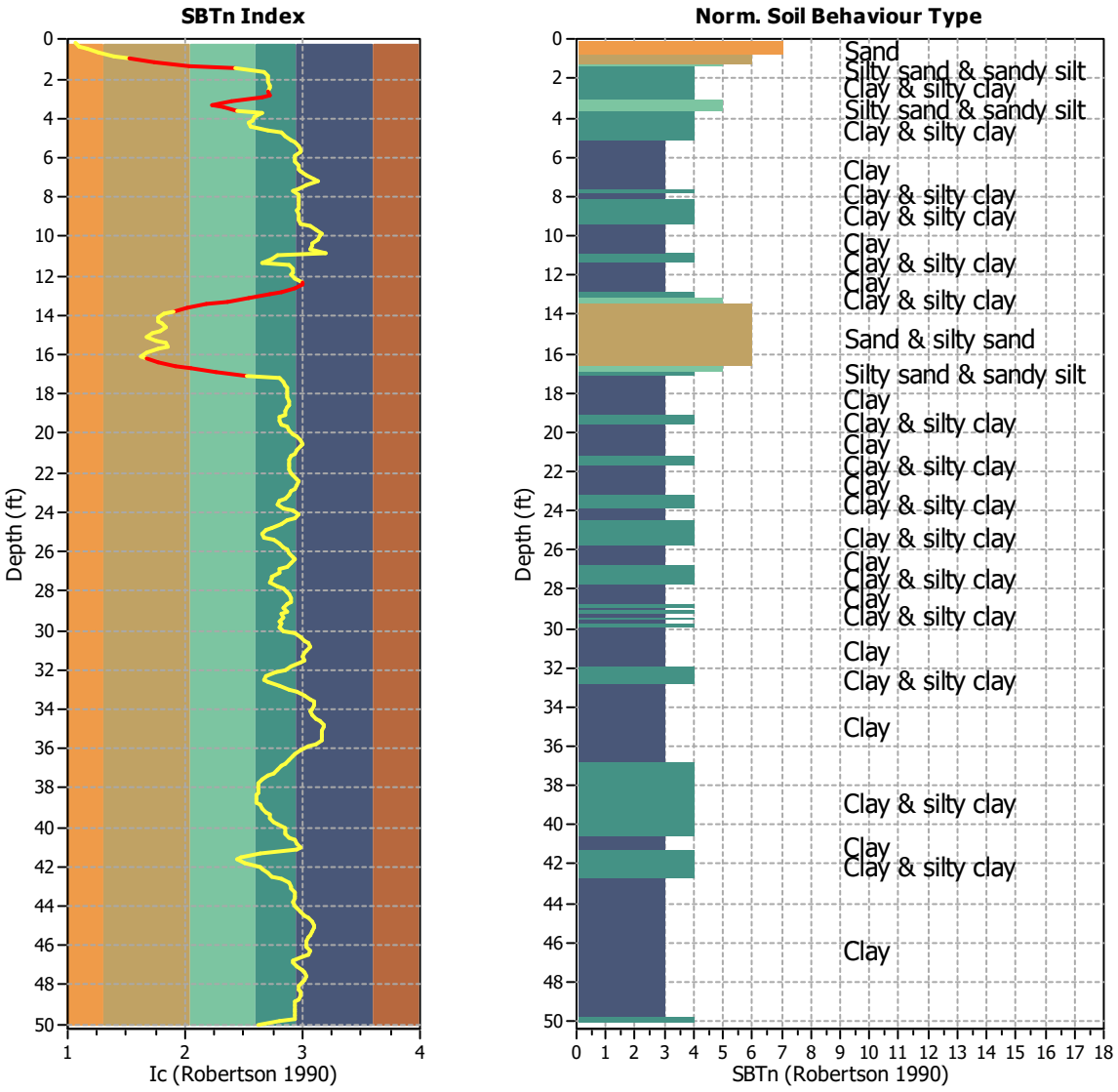
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties	
I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0200
Minimum number of points in layer:	3

General statistics	
Total points in CPT file:	306
Total points excluded:	28
Exclusion percentage:	9.15%
Number of layers detected:	5

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 1	4	Start depth: 1.15 (ft)	6	Sand & silty sand
		End depth: 1.64 (ft)	4	Clay & silty clay
Transition layer 2	4	Start depth: 2.79 (ft)	4	Clay & silty clay
		End depth: 3.28 (ft)	5	Silty sand & sandy silt
Transition layer 3	4	Start depth: 3.28 (ft)	5	Silty sand & sandy silt
		End depth: 3.77 (ft)	4	Clay & silty clay
Transition layer 4	10	Start depth: 12.47 (ft)	3	Clay
		End depth: 13.94 (ft)	6	Sand & silty sand
Transition layer 5	6	Start depth: 16.40 (ft)	6	Sand & silty sand
		End depth: 17.22 (ft)	3	Clay

Start depth: Depth where the transition layer begins
End depth: Depth where the transition layer ends

:: Field input data ::

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1	0.16	669.22	3.57	4.69	0.00	136.76
2	0.33	859.25	5.27	0.52	0.00	137.28
3	0.49	930.55	6.98	1.08	0.00	137.28
4	0.66	718.06	6.77	2.49	0.01	137.28
5	0.82	506.86	5.54	-0.89	1.35	137.28
6	0.98	301.09	3.92	1.10	3.16	134.54
7	1.15	180.46	2.53	3.41	7.00	130.82
8	1.31	78.48	2.25	1.44	13.82	126.82
9	1.48	31.86	1.48	2.35	27.24	122.72
10	1.64	21.48	0.92	1.93	38.83	117.79
11	1.80	16.32	0.53	2.16	40.73	113.83
12	1.97	15.21	0.42	2.31	40.53	110.96
13	2.13	14.13	0.38	1.63	40.74	109.67
14	2.30	13.14	0.34	0.61	41.34	108.74
15	2.46	12.64	0.31	-0.01	41.68	108.30
16	2.63	12.95	0.33	-0.50	40.28	108.40
17	2.79	14.84	0.34	0.11	41.65	109.78
18	2.95	14.09	0.50	0.26	38.39	109.12
19	3.12	15.26	0.21	0.29	26.16	113.66
20	3.28	52.45	0.88	-0.72	19.98	115.96
21	3.45	49.12	0.84	0.51	23.35	118.55
22	3.61	16.92	1.01	1.19	28.31	117.18
23	3.77	26.22	0.61	3.40	38.53	115.45
24	3.94	18.66	0.60	1.06	34.72	113.61
25	4.10	17.32	0.51	-0.68	34.41	112.49
26	4.27	23.21	0.39	0.32	32.89	110.61
27	4.43	15.65	0.28	-1.04	33.42	107.82
28	4.59	9.21	0.18	-0.50	41.03	104.17
29	4.76	7.63	0.13	0.27	47.47	101.50
30	4.92	7.53	0.14	0.86	49.36	101.33
31	5.09	7.95	0.18	0.71	51.66	102.44
32	5.25	7.60	0.20	0.35	54.00	103.10
33	5.41	7.07	0.19	0.35	56.76	102.78
34	5.58	6.34	0.17	0.49	57.35	102.35
35	5.74	6.95	0.18	0.46	57.68	102.54
36	5.91	7.14	0.20	-0.41	54.48	103.23
37	6.07	8.54	0.20	-0.54	54.52	103.61
38	6.23	7.39	0.21	-1.20	54.41	103.96
39	6.40	7.60	0.23	-0.34	56.25	104.28
40	6.56	8.00	0.24	-0.78	55.99	104.05
41	6.73	7.28	0.19	-0.27	57.52	103.43
42	6.89	6.26	0.19	-0.09	60.85	102.21
43	7.05	5.49	0.16	-0.37	65.89	100.94
44	7.22	4.55	0.12	0.07	67.67	99.57
45	7.38	4.81	0.12	0.38	60.83	99.00
46	7.55	7.16	0.12	0.91	56.37	99.21
47	7.71	6.32	0.12	0.40	53.57	98.72
48	7.87	5.56	0.09	0.63	56.10	97.19

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
49	8.04	5.04	0.07	0.73	56.55	94.82
50	8.20	4.63	0.05	1.06	56.64	92.83
51	8.37	4.42	0.05	1.32	56.38	91.28
52	8.53	4.33	0.04	1.73	56.18	90.26
53	8.69	4.21	0.04	2.35	55.72	89.41
54	8.86	4.17	0.03	2.68	56.01	88.92
55	9.02	4.04	0.03	2.81	56.06	88.24
56	9.19	3.93	0.03	2.84	56.53	87.68
57	9.35	3.84	0.03	3.23	57.30	87.40
58	9.51	3.75	0.03	3.30	62.56	89.93
59	9.68	3.69	0.06	3.26	66.60	94.64
60	9.84	5.04	0.13	3.09	70.11	99.39
61	10.01	5.57	0.21	2.08	69.41	102.65
62	10.17	6.18	0.26	2.06	67.26	104.76
63	10.34	7.53	0.29	2.74	64.54	105.92
64	10.50	7.74	0.31	2.08	63.64	106.62
65	10.66	7.34	0.33	1.61	63.51	106.43
66	10.83	7.41	0.27	1.94	73.06	109.42
67	10.99	7.26	0.78	2.18	45.17	113.89
68	11.16	34.08	0.89	0.51	42.81	116.37
69	11.32	17.90	0.88	-1.39	38.53	115.63
70	11.48	11.56	0.48	-0.92	51.36	112.65
71	11.65	10.27	0.39	2.06	53.54	109.87
72	11.81	10.96	0.41	2.58	52.91	109.62
73	11.98	11.56	0.44	2.91	52.45	110.00
74	12.14	11.25	0.44	2.54	54.12	110.22
75	12.30	10.16	0.46	2.58	58.12	110.46
76	12.47	9.37	0.51	2.58	58.44	111.12
77	12.63	12.11	0.56	3.90	54.39	112.13
78	12.80	14.77	0.61	3.43	47.12	113.32
79	12.96	18.53	0.67	3.05	41.25	114.57
80	13.12	23.40	0.75	5.78	32.80	116.43
81	13.29	38.70	0.91	1.77	24.65	117.38
82	13.45	50.76	0.71	0.41	18.27	117.15
83	13.62	56.22	0.49	-0.47	13.28	115.57
84	13.78	65.84	0.40	-1.36	10.34	114.45
85	13.94	73.28	0.43	-1.51	8.44	113.44
86	14.11	73.40	0.29	-2.02	5.00	111.66
87	14.27	62.32	0.17	-2.86	5.00	108.68
88	14.44	52.70	0.15	-2.13	5.00	107.40
89	14.60	56.15	0.21	1.33	5.00	109.09
90	14.76	63.30	0.30	1.92	5.00	109.67
91	14.93	73.36	0.18	3.49	5.00	109.54
92	15.09	73.76	0.18	2.73	5.00	108.44
93	15.26	77.04	0.20	1.40	5.00	112.37
94	15.42	74.66	0.57	1.55	8.75	114.99
95	15.58	75.50	0.58	2.86	9.11	116.53
96	15.75	89.10	0.49	4.39	7.61	115.98

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
97	15.91	95.11	0.41	2.96	5.00	114.24
98	16.08	97.88	0.24	3.88	4.74	112.50
99	16.24	90.04	0.24	2.54	5.00	113.19
100	16.40	84.33	0.52	3.86	7.57	116.10
101	16.57	89.49	0.74	4.05	10.97	120.82
102	16.73	95.16	1.58	3.63	14.45	122.55
103	16.90	60.68	1.38	4.66	21.23	122.28
104	17.06	22.49	1.00	6.04	32.07	118.84
105	17.22	16.82	0.61	24.98	46.00	115.25
106	17.39	16.41	0.61	22.96	47.87	113.67
107	17.55	15.63	0.65	21.01	49.07	113.58
108	17.72	15.45	0.61	18.12	50.15	113.27
109	17.88	14.66	0.55	18.77	49.83	112.70
110	18.05	14.79	0.52	19.90	49.74	112.22
111	18.21	14.54	0.51	19.84	50.37	111.91
112	18.37	13.47	0.50	18.06	51.17	111.24
113	18.54	12.74	0.41	19.09	51.19	110.45
114	18.70	13.04	0.38	20.12	50.57	109.99
115	18.87	13.21	0.42	21.01	49.49	110.31
116	19.03	14.49	0.45	21.16	48.67	111.20
117	19.19	15.81	0.51	22.97	46.09	111.87
118	19.36	17.70	0.51	24.70	45.83	112.07
119	19.52	15.42	0.48	21.12	46.88	111.57
120	19.69	13.51	0.44	22.86	49.74	110.62
121	19.85	12.72	0.38	22.87	51.54	109.56
122	20.01	11.77	0.34	23.42	52.98	108.38
123	20.18	10.37	0.29	21.60	54.76	106.99
124	20.34	9.34	0.23	21.78	57.33	105.52
125	20.51	8.25	0.21	21.82	58.11	104.32
126	20.67	8.53	0.20	24.33	57.29	103.99
127	20.83	9.43	0.21	24.40	55.06	104.33
128	21.00	9.95	0.22	26.43	53.76	105.09
129	21.16	10.39	0.25	27.40	52.29	105.97
130	21.33	11.68	0.27	30.36	51.41	106.64
131	21.49	11.65	0.28	30.94	50.69	106.98
132	21.65	11.52	0.28	32.92	51.03	107.13
133	21.82	11.69	0.29	34.37	51.23	107.48
134	21.98	12.11	0.32	35.12	51.72	107.85
135	22.15	11.82	0.32	34.35	53.13	108.03
136	22.31	10.98	0.32	33.07	54.72	107.80
137	22.47	10.65	0.30	33.03	55.82	107.35
138	22.64	10.40	0.28	36.73	55.41	107.06
139	22.80	10.82	0.29	39.94	54.24	106.98
140	22.97	11.37	0.29	39.85	52.22	107.55
141	23.13	12.86	0.33	41.87	51.12	108.75
142	23.29	13.97	0.42	36.61	49.01	110.26
143	23.46	16.42	0.47	43.59	46.48	111.36
144	23.62	18.27	0.47	42.76	45.70	111.93

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
145	23.79	16.48	0.50	36.13	48.12	111.91
146	23.95	13.86	0.50	24.23	52.79	111.21
147	24.11	12.12	0.40	30.40	55.83	110.35
148	24.28	12.30	0.39	31.18	54.46	110.46
149	24.44	15.20	0.50	32.52	49.86	112.30
150	24.61	20.65	0.66	32.93	46.69	114.49
151	24.77	22.31	0.81	29.73	42.86	116.38
152	24.93	27.59	0.92	46.08	39.44	117.63
153	25.10	32.88	0.97	23.71	38.22	118.02
154	25.26	27.24	0.90	22.06	39.12	117.39
155	25.43	23.11	0.74	24.71	43.03	115.61
156	25.59	18.30	0.54	25.51	46.11	113.50
157	25.76	15.76	0.46	28.64	48.55	112.03
158	25.92	16.19	0.48	27.03	50.00	111.90
159	26.08	16.46	0.53	26.08	51.42	112.43
160	26.25	15.71	0.57	21.47	53.03	112.54
161	26.41	15.02	0.52	18.37	53.75	112.46
162	26.58	15.70	0.52	23.87	51.87	112.42
163	26.74	17.64	0.54	22.73	50.24	113.30
164	26.90	19.06	0.68	23.74	46.61	114.55
165	27.07	24.23	0.75	16.02	45.97	115.53
166	27.23	21.85	0.77	24.62	42.79	116.45
167	27.40	27.91	0.87	25.18	42.67	117.21
168	27.56	27.50	0.97	23.94	41.68	117.75
169	27.72	26.38	0.92	18.00	45.34	117.32
170	27.89	19.54	0.81	11.44	47.93	116.35
171	28.05	20.03	0.72	15.45	50.54	115.30
172	28.22	19.56	0.67	15.21	50.62	114.90
173	28.38	18.31	0.71	17.15	52.45	114.65
174	28.54	17.12	0.68	21.11	51.89	114.30
175	28.71	19.27	0.58	23.30	49.87	113.77
176	28.87	19.27	0.56	30.06	48.02	113.50
177	29.04	18.73	0.59	28.03	50.12	114.34
178	29.20	18.98	0.79	30.74	46.76	115.42
179	29.36	27.52	0.77	24.43	48.04	116.24
180	29.53	19.92	0.84	11.71	46.38	116.58
181	29.69	23.08	0.86	20.39	47.41	116.37
182	29.86	25.47	0.73	11.81	46.65	115.51
183	30.02	18.24	0.59	15.19	48.57	114.15
184	30.18	16.18	0.55	19.05	53.95	113.08
185	30.35	16.18	0.57	19.55	57.74	112.95
186	30.51	14.29	0.60	15.33	59.76	112.88
187	30.68	14.38	0.56	16.68	62.33	112.28
188	30.84	13.03	0.47	13.80	62.82	111.17
189	31.00	11.90	0.40	16.62	61.19	110.89
190	31.17	15.14	0.50	17.50	59.86	111.15
191	31.33	14.68	0.50	10.92	58.84	112.10
192	31.50	14.73	0.56	19.38	59.71	112.75

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
193	31.66	15.87	0.63	16.93	57.06	113.27
194	31.82	18.24	0.58	22.05	52.27	113.39
195	31.99	20.09	0.53	27.25	48.60	113.38
196	32.15	20.32	0.59	29.37	44.00	114.64
197	32.32	28.92	0.79	40.34	40.09	116.50
198	32.48	34.95	0.93	21.51	39.01	117.30
199	32.64	26.65	0.79	19.82	40.93	116.66
200	32.81	22.08	0.64	29.49	46.43	115.28
201	32.97	19.68	0.66	28.43	50.76	113.97
202	33.14	16.45	0.54	27.48	55.11	113.15
203	33.30	15.05	0.52	28.62	59.35	112.09
204	33.47	13.37	0.49	23.85	63.13	111.16
205	33.63	11.72	0.41	24.25	65.54	110.06
206	33.79	11.60	0.36	24.49	65.03	109.08
207	33.96	12.22	0.34	22.63	63.76	108.45
208	34.12	11.64	0.32	23.11	62.88	108.13
209	34.28	11.75	0.31	25.19	63.64	108.28
210	34.45	12.01	0.37	24.17	66.02	108.94
211	34.61	11.23	0.41	22.79	69.34	109.76
212	34.78	11.14	0.45	22.95	71.78	110.36
213	34.94	11.64	0.48	21.73	71.34	110.99
214	35.11	12.52	0.52	23.75	69.81	111.60
215	35.27	13.23	0.55	17.60	70.00	111.91
216	35.43	12.25	0.53	13.53	70.68	111.68
217	35.60	11.92	0.48	14.70	70.48	111.27
218	35.76	12.76	0.47	16.79	67.14	111.41
219	35.93	14.67	0.53	17.29	61.84	112.54
220	36.09	18.14	0.64	19.48	57.72	114.26
221	36.25	20.72	0.80	19.22	54.43	115.84
222	36.42	22.94	0.89	20.10	52.63	116.92
223	36.58	24.19	0.93	16.17	51.12	117.28
224	36.75	24.34	0.88	18.88	49.39	117.24
225	36.91	25.62	0.84	21.58	47.19	117.10
226	37.07	27.34	0.84	23.94	44.85	117.26
227	37.24	29.36	0.89	24.83	43.16	117.96
228	37.40	32.13	1.03	27.82	40.52	119.12
229	37.57	39.25	1.19	27.35	38.00	120.43
230	37.73	43.83	1.33	29.59	36.51	121.12
231	37.89	41.43	1.28	32.70	36.32	121.50
232	38.06	42.51	1.35	36.70	36.59	121.23
233	38.22	41.32	1.22	31.20	36.73	120.96
234	38.39	39.30	1.16	36.17	35.78	120.34
235	38.55	41.71	1.06	43.45	35.98	119.90
236	38.71	38.01	1.05	38.01	35.56	119.27
237	38.88	36.86	0.91	42.50	36.93	118.72
238	39.04	34.51	0.90	43.24	38.00	118.12
239	39.21	31.88	0.87	36.96	40.23	117.53
240	39.37	28.49	0.77	36.81	41.97	116.73

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
241	39.53	27.16	0.70	37.22	41.47	115.88
242	39.70	29.44	0.63	36.59	43.02	115.08
243	39.86	22.46	0.60	30.32	45.38	114.12
244	40.03	19.70	0.52	33.26	49.32	113.00
245	40.19	20.20	0.45	34.78	49.03	111.47
246	40.35	18.63	0.33	34.40	49.29	109.92
247	40.52	15.54	0.29	35.71	51.36	108.29
248	40.68	14.34	0.27	38.91	54.48	107.60
249	40.85	14.30	0.28	41.33	55.22	107.61
250	41.01	14.88	0.30	43.84	57.34	109.99
251	41.18	17.03	0.57	46.74	55.43	114.03
252	41.34	25.87	0.98	49.87	37.03	121.16
253	41.50	83.82	2.24	24.95	29.67	125.12
254	41.67	85.12	2.44	-0.97	28.32	126.83
255	41.83	55.82	2.15	0.11	31.29	125.36
256	42.00	48.87	1.33	3.62	37.61	122.55
257	42.16	32.40	1.02	4.47	38.17	119.23
258	42.32	32.48	0.69	6.56	40.63	116.94
259	42.49	30.66	0.64	6.36	42.27	115.10
260	42.65	21.05	0.57	7.21	46.87	113.89
261	42.82	20.05	0.49	8.85	51.15	112.81
262	42.98	21.34	0.48	9.40	51.77	112.50
263	43.14	19.49	0.52	9.97	52.50	112.81
264	43.31	20.08	0.56	9.74	54.44	113.34
265	43.47	20.57	0.60	10.53	54.46	113.95
266	43.64	21.26	0.65	10.91	54.11	114.56
267	43.80	22.37	0.69	11.46	53.58	115.04
268	43.96	22.83	0.71	11.52	53.97	115.24
269	44.13	21.48	0.70	11.83	55.35	115.11
270	44.29	20.32	0.67	11.56	57.67	114.78
271	44.46	19.17	0.66	10.77	59.89	114.35
272	44.62	17.91	0.62	10.88	62.31	113.95
273	44.78	16.93	0.61	11.03	64.31	113.63
274	44.95	16.59	0.60	11.92	65.27	113.44
275	45.11	16.70	0.59	11.81	65.35	113.55
276	45.28	17.18	0.63	12.20	63.71	113.49
277	45.44	18.02	0.57	12.18	62.81	113.18
278	45.60	16.89	0.51	13.19	61.29	112.01
279	45.77	16.01	0.39	14.02	61.13	110.63
280	45.93	15.27	0.34	14.62	60.80	109.34
281	46.10	14.67	0.33	15.99	61.04	108.87
282	46.26	14.98	0.33	16.68	62.71	109.40
283	46.42	14.93	0.42	17.43	61.36	110.44
284	46.59	17.85	0.47	18.37	58.16	111.89
285	46.75	21.27	0.54	16.58	52.98	112.54
286	46.92	22.46	0.49	17.77	53.08	113.26
287	47.08	19.84	0.60	18.37	55.02	113.88
288	47.24	20.72	0.68	19.00	59.01	114.72

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
289	47.41	20.22	0.73	17.86	59.65	114.82
290	47.57	19.46	0.63	18.14	60.19	114.10
291	47.74	18.28	0.52	18.60	59.69	112.80
292	47.90	17.54	0.45	19.96	58.79	111.94
293	48.06	18.37	0.46	21.15	56.77	111.90
294	48.23	20.33	0.49	25.07	56.62	111.78
295	48.39	17.42	0.43	26.20	57.42	111.20
296	48.56	16.12	0.37	28.16	57.58	109.95
297	48.72	17.40	0.31	29.62	56.35	109.33
298	48.89	17.32	0.34	31.11	53.90	109.09
299	49.05	18.05	0.33	34.00	54.26	109.79
300	49.21	18.58	0.40	35.81	53.74	110.62
301	49.38	19.82	0.45	37.60	54.01	111.57
302	49.54	20.11	0.48	39.61	54.04	112.40
303	49.71	20.74	0.54	42.70	53.76	113.20
304	49.87	22.38	0.59	43.07	46.13	110.74
305	50.03	23.46	0.00	43.84	36.50	106.12
306	50.20	23.87	0.00	45.50	0.00	87.36

Abbreviations

Depth:	Depth from free surface, at which CPT was performed (ft)
q_c:	Measured cone resistance (tsf)
f_s:	Sleeve friction resistance (tsf)
u:	Pore pressure (tsf)
Fines content:	Percentage of fines in soil (%)
Unit weight:	Bulk soil unit weight (pcf)

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1	0.16	0.01	0.00	0.01	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
2	0.33	0.02	0.00	0.02	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
3	0.49	0.03	0.00	0.03	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
4	0.66	0.04	0.00	0.04	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
5	0.82	0.06	0.00	0.06	1.00	0.364	1.15	0.316	1.00	1.00	2.000	No
6	0.98	0.07	0.00	0.07	1.00	0.364	1.15	0.316	1.00	1.00	2.000	No
7	1.15	0.08	0.00	0.08	1.00	0.364	1.15	0.316	1.00	1.00	2.000	Yes
8	1.31	0.09	0.00	0.09	1.00	0.364	1.15	0.316	1.00	1.00	2.000	Yes
9	1.48	0.10	0.00	0.10	1.00	0.363	1.15	0.316	1.00	1.00	2.000	Yes
10	1.64	0.11	0.00	0.11	1.00	0.363	1.15	0.316	1.00	1.00	2.000	Yes
11	1.80	0.12	0.00	0.12	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
12	1.97	0.13	0.00	0.13	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
13	2.13	0.14	0.00	0.14	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
14	2.30	0.14	0.00	0.14	1.00	0.363	1.15	0.315	1.00	1.00	2.000	No
15	2.46	0.15	0.00	0.15	1.00	0.363	1.15	0.315	1.00	1.00	2.000	No
16	2.63	0.16	0.00	0.16	1.00	0.362	1.15	0.315	1.00	1.00	2.000	No
17	2.79	0.17	0.00	0.17	1.00	0.362	1.15	0.315	1.00	1.00	2.000	Yes
18	2.95	0.18	0.00	0.18	1.00	0.362	1.15	0.315	1.00	1.00	2.000	Yes
19	3.12	0.19	0.00	0.19	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
20	3.28	0.20	0.00	0.20	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
21	3.45	0.21	0.00	0.21	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
22	3.61	0.22	0.00	0.22	0.99	0.362	1.15	0.314	1.00	1.00	2.000	Yes
23	3.77	0.23	0.00	0.23	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
24	3.94	0.24	0.00	0.24	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
25	4.10	0.25	0.00	0.25	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
26	4.27	0.26	0.00	0.26	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
27	4.43	0.26	0.00	0.26	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
28	4.59	0.27	0.00	0.27	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
29	4.76	0.28	0.00	0.28	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
30	4.92	0.29	0.00	0.29	0.99	0.361	1.15	0.313	1.00	1.00	2.000	No
31	5.09	0.30	0.00	0.30	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
32	5.25	0.31	0.00	0.31	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
33	5.41	0.31	0.00	0.31	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
34	5.58	0.32	0.00	0.32	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
35	5.74	0.33	0.00	0.33	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
36	5.91	0.34	0.00	0.34	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
37	6.07	0.35	0.00	0.35	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
38	6.23	0.36	0.00	0.36	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
39	6.40	0.37	0.00	0.37	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
40	6.56	0.37	0.00	0.37	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
41	6.73	0.38	0.00	0.38	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
42	6.89	0.39	0.00	0.39	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
43	7.05	0.40	0.00	0.40	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
44	7.22	0.41	0.00	0.41	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
45	7.38	0.42	0.00	0.42	0.98	0.358	1.15	0.312	1.00	1.00	2.000	No
46	7.55	0.42	0.00	0.42	0.98	0.358	1.15	0.312	1.00	1.00	2.000	No
47	7.71	0.43	0.00	0.43	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
48	7.87	0.44	0.00	0.44	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
49	8.04	0.45	0.00	0.45	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
50	8.20	0.46	0.00	0.46	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
51	8.37	0.46	0.00	0.46	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
52	8.53	0.47	0.00	0.47	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
53	8.69	0.48	0.00	0.48	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
54	8.86	0.48	0.00	0.48	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
55	9.02	0.49	0.00	0.49	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
56	9.19	0.50	0.00	0.50	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
57	9.35	0.51	0.00	0.51	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
58	9.51	0.51	0.00	0.51	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
59	9.68	0.52	0.00	0.52	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
60	9.84	0.53	0.00	0.53	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
61	10.01	0.54	0.00	0.54	0.98	0.357	1.15	0.310	1.00	1.00	0.310	No
62	10.17	0.55	0.01	0.54	0.98	0.360	1.15	0.313	1.00	1.00	0.313	No
63	10.34	0.56	0.01	0.54	0.98	0.363	1.15	0.316	1.00	1.00	0.316	No
64	10.50	0.56	0.02	0.55	0.98	0.366	1.15	0.318	1.00	1.00	0.318	No
65	10.66	0.57	0.02	0.55	0.98	0.369	1.15	0.321	1.00	1.00	0.321	No
66	10.83	0.58	0.03	0.56	0.98	0.372	1.15	0.324	1.00	1.00	0.324	No
67	10.99	0.59	0.03	0.56	0.98	0.375	1.15	0.326	1.00	1.00	0.326	No
68	11.16	0.60	0.04	0.56	0.98	0.378	1.15	0.329	1.00	1.00	0.329	No
69	11.32	0.61	0.04	0.57	0.98	0.381	1.15	0.331	1.00	1.00	0.331	No
70	11.48	0.62	0.05	0.57	0.98	0.384	1.15	0.334	1.00	1.00	0.334	No
71	11.65	0.63	0.05	0.58	0.98	0.387	1.15	0.336	1.00	1.00	0.336	No
72	11.81	0.64	0.06	0.58	0.98	0.390	1.15	0.339	1.00	1.00	0.339	No
73	11.98	0.65	0.06	0.58	0.97	0.392	1.15	0.341	1.00	1.00	0.341	No
74	12.14	0.66	0.07	0.59	0.97	0.395	1.15	0.343	1.00	1.00	0.343	No
75	12.30	0.66	0.07	0.59	0.97	0.398	1.15	0.346	1.00	1.00	0.346	No
76	12.47	0.67	0.08	0.60	0.97	0.400	1.15	0.348	1.00	1.00	2.000	Yes
77	12.63	0.68	0.08	0.60	0.97	0.403	1.15	0.350	1.00	1.00	2.000	Yes
78	12.80	0.69	0.09	0.60	0.97	0.405	1.15	0.352	1.00	1.00	2.000	Yes
79	12.96	0.70	0.09	0.61	0.97	0.408	1.15	0.355	1.00	1.00	2.000	Yes
80	13.12	0.71	0.10	0.61	0.97	0.410	1.15	0.357	1.00	1.00	2.000	Yes
81	13.29	0.72	0.10	0.62	0.97	0.413	1.15	0.359	1.00	1.00	2.000	Yes
82	13.45	0.73	0.11	0.62	0.97	0.415	1.15	0.361	1.00	1.00	2.000	Yes
83	13.62	0.74	0.11	0.63	0.97	0.417	1.15	0.363	1.00	1.00	2.000	Yes
84	13.78	0.75	0.12	0.63	0.97	0.420	1.15	0.365	1.00	1.00	2.000	Yes
85	13.94	0.76	0.12	0.64	0.97	0.422	1.15	0.367	1.00	1.00	2.000	Yes
86	14.11	0.77	0.13	0.64	0.97	0.424	1.15	0.369	1.00	1.00	0.369	No
87	14.27	0.78	0.13	0.64	0.97	0.426	1.15	0.371	1.00	1.00	0.371	No
88	14.44	0.79	0.14	0.65	0.97	0.429	1.15	0.373	1.00	1.00	0.373	No
89	14.60	0.79	0.14	0.65	0.97	0.431	1.15	0.374	1.00	1.00	0.374	No
90	14.76	0.80	0.15	0.65	0.97	0.433	1.15	0.376	1.00	1.00	0.376	No
91	14.93	0.81	0.15	0.66	0.97	0.435	1.15	0.378	1.00	1.00	0.378	No
92	15.09	0.82	0.16	0.66	0.97	0.437	1.15	0.380	1.00	1.00	0.380	No
93	15.26	0.83	0.16	0.67	0.97	0.439	1.15	0.382	1.00	1.00	0.382	No
94	15.42	0.84	0.17	0.67	0.97	0.441	1.15	0.383	1.00	1.00	0.383	No
95	15.58	0.85	0.17	0.68	0.97	0.443	1.15	0.385	1.00	1.00	0.385	No
96	15.75	0.86	0.18	0.68	0.97	0.445	1.15	0.387	1.00	1.00	0.387	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
97	15.91	0.87	0.18	0.68	0.97	0.447	1.15	0.388	1.00	1.00	0.388	No
98	16.08	0.88	0.19	0.69	0.97	0.449	1.15	0.390	1.00	1.00	0.390	No
99	16.24	0.89	0.19	0.69	0.97	0.450	1.15	0.392	1.00	1.00	0.392	No
100	16.40	0.90	0.20	0.70	0.97	0.452	1.15	0.393	1.00	1.00	2.000	Yes
101	16.57	0.91	0.20	0.70	0.97	0.454	1.15	0.395	1.00	1.00	2.000	Yes
102	16.73	0.92	0.21	0.71	0.96	0.456	1.15	0.396	1.00	1.00	2.000	Yes
103	16.90	0.93	0.22	0.71	0.96	0.457	1.15	0.398	1.00	1.00	2.000	Yes
104	17.06	0.94	0.22	0.72	0.96	0.459	1.15	0.399	1.00	1.00	2.000	Yes
105	17.22	0.95	0.23	0.72	0.96	0.461	1.15	0.400	1.00	1.00	2.000	Yes
106	17.39	0.95	0.23	0.72	0.96	0.462	1.15	0.402	1.00	1.00	0.402	No
107	17.55	0.96	0.24	0.73	0.96	0.464	1.15	0.403	1.00	1.00	0.403	No
108	17.72	0.97	0.24	0.73	0.96	0.465	1.15	0.405	1.00	1.00	0.405	No
109	17.88	0.98	0.25	0.74	0.96	0.467	1.15	0.406	1.00	1.00	0.406	No
110	18.05	0.99	0.25	0.74	0.96	0.469	1.15	0.407	1.00	1.00	0.407	No
111	18.21	1.00	0.26	0.74	0.96	0.470	1.15	0.409	1.00	1.00	0.409	No
112	18.37	1.01	0.26	0.75	0.96	0.472	1.15	0.410	1.00	1.00	0.410	No
113	18.54	1.02	0.27	0.75	0.96	0.473	1.15	0.412	1.00	1.00	0.412	No
114	18.70	1.03	0.27	0.76	0.96	0.475	1.15	0.413	1.00	1.00	0.413	No
115	18.87	1.04	0.28	0.76	0.96	0.476	1.15	0.414	1.00	1.00	0.414	No
116	19.03	1.05	0.28	0.76	0.96	0.478	1.15	0.415	1.00	1.00	0.415	No
117	19.19	1.06	0.29	0.77	0.96	0.479	1.15	0.417	1.00	1.00	0.417	No
118	19.36	1.06	0.29	0.77	0.96	0.481	1.15	0.418	1.00	1.00	0.418	No
119	19.52	1.07	0.30	0.78	0.96	0.482	1.15	0.419	1.00	1.00	0.419	No
120	19.69	1.08	0.30	0.78	0.96	0.484	1.15	0.420	1.00	1.00	0.420	No
121	19.85	1.09	0.31	0.78	0.96	0.485	1.15	0.422	1.00	1.00	0.422	No
122	20.01	1.10	0.31	0.79	0.96	0.486	1.15	0.423	1.00	1.00	0.423	No
123	20.18	1.11	0.32	0.79	0.96	0.488	1.15	0.424	1.00	1.00	0.424	No
124	20.34	1.12	0.32	0.80	0.96	0.489	1.15	0.425	1.00	1.00	0.425	No
125	20.51	1.13	0.33	0.80	0.96	0.490	1.15	0.426	1.00	1.00	0.426	No
126	20.67	1.14	0.33	0.80	0.96	0.492	1.15	0.428	1.00	1.00	0.428	No
127	20.83	1.14	0.34	0.81	0.95	0.493	1.15	0.429	1.00	1.00	0.429	No
128	21.00	1.15	0.34	0.81	0.95	0.495	1.15	0.430	1.00	1.00	0.430	No
129	21.16	1.16	0.35	0.81	0.95	0.496	1.15	0.431	1.00	1.00	0.431	No
130	21.33	1.17	0.35	0.82	0.95	0.497	1.15	0.432	1.00	1.00	0.432	No
131	21.49	1.18	0.36	0.82	0.95	0.498	1.15	0.433	1.00	1.00	0.433	No
132	21.65	1.19	0.36	0.82	0.95	0.500	1.15	0.434	1.00	1.00	0.434	No
133	21.82	1.20	0.37	0.83	0.95	0.501	1.15	0.435	1.00	1.00	0.435	No
134	21.98	1.21	0.37	0.83	0.95	0.502	1.15	0.437	1.00	1.00	0.437	No
135	22.15	1.21	0.38	0.84	0.95	0.503	1.15	0.438	1.00	1.00	0.438	No
136	22.31	1.22	0.38	0.84	0.95	0.504	1.15	0.439	1.00	1.00	0.439	No
137	22.47	1.23	0.39	0.84	0.95	0.506	1.15	0.440	1.00	1.00	0.440	No
138	22.64	1.24	0.39	0.85	0.95	0.507	1.15	0.441	1.00	1.00	0.441	No
139	22.80	1.25	0.40	0.85	0.95	0.508	1.15	0.441	1.00	1.00	0.441	No
140	22.97	1.26	0.40	0.85	0.95	0.509	1.15	0.442	1.00	1.00	0.442	No
141	23.13	1.27	0.41	0.86	0.95	0.510	1.15	0.443	1.00	1.00	0.443	No
142	23.29	1.28	0.41	0.86	0.95	0.511	1.15	0.444	1.00	1.00	0.444	No
143	23.46	1.29	0.42	0.87	0.95	0.512	1.15	0.445	1.00	1.00	0.445	No
144	23.62	1.29	0.43	0.87	0.95	0.513	1.15	0.446	1.00	1.00	0.446	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
145	23.79	1.30	0.43	0.87	0.95	0.514	1.15	0.447	1.00	1.00	0.447	No
146	23.95	1.31	0.44	0.88	0.95	0.515	1.15	0.448	1.00	1.00	0.448	No
147	24.11	1.32	0.44	0.88	0.94	0.516	1.15	0.448	1.00	1.00	0.448	No
148	24.28	1.33	0.45	0.89	0.94	0.517	1.15	0.449	1.00	1.00	0.449	No
149	24.44	1.34	0.45	0.89	0.94	0.518	1.15	0.450	1.00	1.00	0.450	No
150	24.61	1.35	0.46	0.89	0.94	0.518	1.15	0.451	1.00	1.00	0.451	No
151	24.77	1.36	0.46	0.90	0.94	0.519	1.15	0.451	1.00	1.00	0.451	No
152	24.93	1.37	0.47	0.90	0.94	0.520	1.15	0.452	1.00	1.00	0.452	No
153	25.10	1.38	0.47	0.91	0.94	0.521	1.15	0.453	1.00	1.00	0.453	No
154	25.26	1.39	0.48	0.91	0.94	0.521	1.15	0.453	1.00	1.00	0.453	No
155	25.43	1.40	0.48	0.92	0.94	0.522	1.15	0.454	1.00	1.00	0.454	No
156	25.59	1.41	0.49	0.92	0.94	0.523	1.15	0.455	1.00	1.00	0.455	No
157	25.76	1.42	0.49	0.92	0.94	0.524	1.15	0.455	1.00	1.00	0.455	No
158	25.92	1.43	0.50	0.93	0.94	0.524	1.15	0.456	1.00	1.00	0.456	No
159	26.08	1.43	0.50	0.93	0.94	0.525	1.15	0.457	1.00	1.00	0.457	No
160	26.25	1.44	0.51	0.94	0.94	0.526	1.15	0.457	1.00	1.00	0.457	No
161	26.41	1.45	0.51	0.94	0.94	0.526	1.15	0.458	1.00	1.00	0.458	No
162	26.58	1.46	0.52	0.94	0.94	0.527	1.15	0.458	1.00	1.00	0.458	No
163	26.74	1.47	0.52	0.95	0.94	0.528	1.15	0.459	1.00	1.00	0.459	No
164	26.90	1.48	0.53	0.95	0.93	0.528	1.15	0.459	1.00	1.00	0.459	No
165	27.07	1.49	0.53	0.96	0.93	0.529	1.15	0.460	1.00	1.00	0.460	No
166	27.23	1.50	0.54	0.96	0.93	0.530	1.15	0.460	1.00	1.00	0.460	No
167	27.40	1.51	0.54	0.97	0.93	0.530	1.15	0.461	1.00	1.00	0.461	No
168	27.56	1.52	0.55	0.97	0.93	0.531	1.15	0.461	1.00	1.00	0.461	No
169	27.72	1.53	0.55	0.98	0.93	0.531	1.15	0.462	1.00	1.00	0.462	No
170	27.89	1.54	0.56	0.98	0.93	0.532	1.15	0.462	1.00	1.00	0.462	No
171	28.05	1.55	0.56	0.98	0.93	0.532	1.15	0.463	1.00	1.00	0.463	No
172	28.22	1.56	0.57	0.99	0.93	0.533	1.15	0.463	1.00	1.00	0.463	No
173	28.38	1.57	0.57	0.99	0.93	0.533	1.15	0.463	1.00	1.00	0.463	No
174	28.54	1.58	0.58	1.00	0.93	0.534	1.15	0.464	1.00	1.00	0.464	No
175	28.71	1.59	0.58	1.00	0.93	0.534	1.15	0.464	1.00	1.00	0.464	No
176	28.87	1.59	0.59	1.01	0.93	0.534	1.15	0.465	1.00	1.00	0.465	No
177	29.04	1.60	0.59	1.01	0.93	0.535	1.15	0.465	1.00	1.00	0.465	No
178	29.20	1.61	0.60	1.01	0.92	0.535	1.15	0.465	1.00	1.00	0.465	No
179	29.36	1.62	0.60	1.02	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
180	29.53	1.63	0.61	1.02	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
181	29.69	1.64	0.61	1.03	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
182	29.86	1.65	0.62	1.03	0.92	0.537	1.15	0.467	1.00	1.00	0.467	No
183	30.02	1.66	0.62	1.04	0.92	0.537	1.15	0.467	1.00	1.00	0.467	No
184	30.18	1.67	0.63	1.04	0.92	0.537	1.15	0.467	1.00	1.00	0.467	No
185	30.35	1.68	0.63	1.04	0.92	0.538	1.15	0.468	1.00	1.00	0.468	No
186	30.51	1.69	0.64	1.05	0.92	0.538	1.15	0.468	1.00	1.00	0.468	No
187	30.68	1.70	0.65	1.05	0.92	0.538	1.15	0.468	1.00	1.00	0.468	No
188	30.84	1.71	0.65	1.06	0.92	0.539	1.15	0.468	1.00	1.00	0.468	No
189	31.00	1.72	0.66	1.06	0.92	0.539	1.15	0.469	1.00	1.00	0.469	No
190	31.17	1.73	0.66	1.06	0.91	0.539	1.15	0.469	1.00	1.00	0.470	No
191	31.33	1.73	0.67	1.07	0.91	0.540	1.15	0.469	1.00	1.00	0.470	No
192	31.50	1.74	0.67	1.07	0.91	0.540	1.15	0.469	1.00	1.00	0.471	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
193	31.66	1.75	0.68	1.08	0.91	0.540	1.15	0.470	1.00	1.00	0.471	No
194	31.82	1.76	0.68	1.08	0.91	0.540	1.15	0.470	1.00	1.00	0.472	No
195	31.99	1.77	0.69	1.09	0.91	0.540	1.15	0.470	0.99	1.00	0.473	No
196	32.15	1.78	0.69	1.09	0.91	0.541	1.15	0.470	0.99	1.00	0.473	No
197	32.32	1.79	0.70	1.09	0.91	0.541	1.15	0.470	0.99	1.00	0.474	No
198	32.48	1.80	0.70	1.10	0.91	0.541	1.15	0.470	0.99	1.00	0.474	No
199	32.64	1.81	0.71	1.10	0.91	0.541	1.15	0.470	0.99	1.00	0.475	No
200	32.81	1.82	0.71	1.11	0.90	0.541	1.15	0.470	0.99	1.00	0.475	No
201	32.97	1.83	0.72	1.11	0.90	0.541	1.15	0.471	0.99	1.00	0.476	No
202	33.14	1.84	0.72	1.12	0.90	0.541	1.15	0.471	0.99	1.00	0.476	No
203	33.30	1.85	0.73	1.12	0.90	0.541	1.15	0.471	0.99	1.00	0.477	No
204	33.47	1.86	0.73	1.12	0.90	0.542	1.15	0.471	0.99	1.00	0.477	No
205	33.63	1.87	0.74	1.13	0.90	0.542	1.15	0.471	0.99	1.00	0.478	No
206	33.79	1.87	0.74	1.13	0.90	0.542	1.15	0.471	0.98	1.00	0.478	No
207	33.96	1.88	0.75	1.14	0.90	0.542	1.15	0.471	0.98	1.00	0.479	No
208	34.12	1.89	0.75	1.14	0.90	0.542	1.15	0.471	0.98	1.00	0.479	No
209	34.28	1.90	0.76	1.14	0.90	0.542	1.15	0.471	0.98	1.00	0.480	No
210	34.45	1.91	0.76	1.15	0.89	0.542	1.15	0.471	0.98	1.00	0.480	No
211	34.61	1.92	0.77	1.15	0.89	0.542	1.15	0.471	0.98	1.00	0.481	No
212	34.78	1.93	0.77	1.15	0.89	0.542	1.15	0.471	0.98	1.00	0.481	No
213	34.94	1.94	0.78	1.16	0.89	0.542	1.15	0.471	0.98	1.00	0.481	No
214	35.11	1.95	0.78	1.16	0.89	0.542	1.15	0.471	0.98	1.00	0.482	No
215	35.27	1.96	0.79	1.17	0.89	0.542	1.15	0.471	0.98	1.00	0.482	No
216	35.43	1.96	0.79	1.17	0.89	0.542	1.15	0.471	0.98	1.00	0.482	No
217	35.60	1.97	0.80	1.17	0.89	0.542	1.15	0.471	0.98	1.00	0.483	No
218	35.76	1.98	0.80	1.18	0.89	0.542	1.15	0.471	0.98	1.00	0.483	No
219	35.93	1.99	0.81	1.18	0.88	0.542	1.15	0.471	0.97	1.00	0.483	No
220	36.09	2.00	0.81	1.19	0.88	0.542	1.15	0.471	0.97	1.00	0.484	No
221	36.25	2.01	0.82	1.19	0.88	0.542	1.15	0.471	0.97	1.00	0.484	No
222	36.42	2.02	0.82	1.20	0.88	0.541	1.15	0.471	0.97	1.00	0.484	No
223	36.58	2.03	0.83	1.20	0.88	0.541	1.15	0.470	0.97	1.00	0.484	No
224	36.75	2.04	0.83	1.20	0.88	0.541	1.15	0.470	0.97	1.00	0.484	No
225	36.91	2.05	0.84	1.21	0.88	0.541	1.15	0.470	0.97	1.00	0.485	No
226	37.07	2.06	0.84	1.21	0.88	0.540	1.15	0.470	0.97	1.00	0.485	No
227	37.24	2.07	0.85	1.22	0.87	0.540	1.15	0.470	0.97	1.00	0.485	No
228	37.40	2.08	0.85	1.22	0.87	0.540	1.15	0.469	0.97	1.00	0.485	No
229	37.57	2.09	0.86	1.23	0.87	0.539	1.15	0.469	0.97	1.00	0.485	No
230	37.73	2.10	0.87	1.23	0.87	0.539	1.15	0.469	0.97	1.00	0.485	No
231	37.89	2.11	0.87	1.24	0.87	0.539	1.15	0.468	0.96	1.00	0.485	No
232	38.06	2.12	0.88	1.24	0.87	0.538	1.15	0.468	0.96	1.00	0.486	No
233	38.22	2.13	0.88	1.25	0.87	0.538	1.15	0.468	0.96	1.00	0.486	No
234	38.39	2.14	0.89	1.25	0.86	0.537	1.15	0.467	0.96	1.00	0.486	No
235	38.55	2.15	0.89	1.26	0.86	0.537	1.15	0.467	0.96	1.00	0.486	No
236	38.71	2.16	0.90	1.26	0.86	0.537	1.15	0.467	0.96	1.00	0.486	No
237	38.88	2.17	0.90	1.27	0.86	0.536	1.15	0.466	0.96	1.00	0.486	No
238	39.04	2.18	0.91	1.27	0.86	0.536	1.15	0.466	0.96	1.00	0.486	No
239	39.21	2.19	0.91	1.27	0.86	0.535	1.15	0.466	0.96	1.00	0.486	No
240	39.37	2.20	0.92	1.28	0.86	0.535	1.15	0.465	0.96	1.00	0.486	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
241	39.53	2.21	0.92	1.28	0.86	0.535	1.15	0.465	0.96	1.00	0.486	No
242	39.70	2.21	0.93	1.29	0.85	0.534	1.15	0.464	0.96	1.00	0.486	No
243	39.86	2.22	0.93	1.29	0.85	0.534	1.15	0.464	0.96	1.00	0.486	No
244	40.03	2.23	0.94	1.30	0.85	0.533	1.15	0.464	0.95	1.00	0.486	No
245	40.19	2.24	0.94	1.30	0.85	0.533	1.15	0.463	0.95	1.00	0.486	No
246	40.35	2.25	0.95	1.30	0.85	0.533	1.15	0.463	0.95	1.00	0.486	No
247	40.52	2.26	0.95	1.31	0.85	0.532	1.15	0.463	0.95	1.00	0.486	No
248	40.68	2.27	0.96	1.31	0.84	0.532	1.15	0.463	0.95	1.00	0.486	No
249	40.85	2.28	0.96	1.32	0.84	0.532	1.15	0.462	0.95	1.00	0.486	No
250	41.01	2.29	0.97	1.32	0.84	0.531	1.15	0.462	0.95	1.00	0.486	No
251	41.18	2.30	0.97	1.32	0.84	0.531	1.15	0.461	0.95	1.00	0.486	No
252	41.34	2.31	0.98	1.33	0.84	0.530	1.15	0.461	0.95	1.00	0.486	No
253	41.50	2.32	0.98	1.33	0.84	0.529	1.15	0.460	0.95	1.00	0.486	No
254	41.67	2.33	0.99	1.34	0.84	0.529	1.15	0.460	0.95	1.00	0.485	No
255	41.83	2.34	0.99	1.34	0.83	0.528	1.15	0.459	0.95	1.00	0.485	No
256	42.00	2.35	1.00	1.35	0.83	0.527	1.15	0.459	0.95	1.00	0.485	No
257	42.16	2.36	1.00	1.35	0.83	0.527	1.15	0.458	0.94	1.00	0.485	No
258	42.32	2.37	1.01	1.36	0.83	0.526	1.15	0.458	0.94	1.00	0.485	No
259	42.49	2.38	1.01	1.36	0.83	0.526	1.15	0.457	0.94	1.00	0.484	No
260	42.65	2.39	1.02	1.37	0.83	0.525	1.15	0.457	0.94	1.00	0.484	No
261	42.82	2.39	1.02	1.37	0.83	0.525	1.15	0.456	0.94	1.00	0.484	No
262	42.98	2.40	1.03	1.38	0.82	0.524	1.15	0.456	0.94	1.00	0.484	No
263	43.14	2.41	1.03	1.38	0.82	0.523	1.15	0.455	0.94	1.00	0.484	No
264	43.31	2.42	1.04	1.38	0.82	0.523	1.15	0.455	0.94	1.00	0.484	No
265	43.47	2.43	1.04	1.39	0.82	0.522	1.15	0.454	0.94	1.00	0.483	No
266	43.64	2.44	1.05	1.39	0.82	0.522	1.15	0.454	0.94	1.00	0.483	No
267	43.80	2.45	1.05	1.40	0.82	0.521	1.15	0.453	0.94	1.00	0.483	No
268	43.96	2.46	1.06	1.40	0.81	0.520	1.15	0.452	0.94	1.00	0.483	No
269	44.13	2.47	1.06	1.40	0.81	0.520	1.15	0.452	0.94	1.00	0.482	No
270	44.29	2.48	1.07	1.41	0.81	0.519	1.15	0.451	0.94	1.00	0.482	No
271	44.46	2.49	1.07	1.41	0.81	0.518	1.15	0.451	0.94	1.00	0.482	No
272	44.62	2.50	1.08	1.42	0.81	0.518	1.15	0.450	0.93	1.00	0.482	No
273	44.78	2.51	1.09	1.42	0.81	0.517	1.15	0.450	0.93	1.00	0.481	No
274	44.95	2.52	1.09	1.43	0.80	0.517	1.15	0.449	0.93	1.00	0.481	No
275	45.11	2.53	1.10	1.43	0.80	0.516	1.15	0.448	0.93	1.00	0.481	No
276	45.28	2.54	1.10	1.43	0.80	0.515	1.15	0.448	0.93	1.00	0.480	No
277	45.44	2.54	1.11	1.44	0.80	0.515	1.15	0.447	0.93	1.00	0.480	No
278	45.60	2.55	1.11	1.44	0.80	0.514	1.15	0.447	0.93	1.00	0.480	No
279	45.77	2.56	1.12	1.45	0.80	0.513	1.15	0.446	0.93	1.00	0.479	No
280	45.93	2.57	1.12	1.45	0.79	0.513	1.15	0.446	0.93	1.00	0.479	No
281	46.10	2.58	1.13	1.45	0.79	0.512	1.15	0.445	0.93	1.00	0.479	No
282	46.26	2.59	1.13	1.46	0.79	0.511	1.15	0.444	0.93	1.00	0.479	No
283	46.42	2.60	1.14	1.46	0.79	0.511	1.15	0.444	0.93	1.00	0.478	No
284	46.59	2.61	1.14	1.47	0.79	0.510	1.15	0.443	0.93	1.00	0.478	No
285	46.75	2.62	1.15	1.47	0.79	0.509	1.15	0.443	0.93	1.00	0.477	No
286	46.92	2.63	1.15	1.47	0.78	0.508	1.15	0.442	0.93	1.00	0.477	No
287	47.08	2.64	1.16	1.48	0.78	0.508	1.15	0.441	0.93	1.00	0.477	No
288	47.24	2.64	1.16	1.48	0.78	0.507	1.15	0.441	0.93	1.00	0.476	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
289	47.41	2.65	1.17	1.49	0.78	0.506	1.15	0.440	0.92	1.00	0.476	No
290	47.57	2.66	1.17	1.49	0.78	0.505	1.15	0.439	0.92	1.00	0.476	No
291	47.74	2.67	1.18	1.50	0.78	0.505	1.15	0.439	0.92	1.00	0.475	No
292	47.90	2.68	1.18	1.50	0.77	0.504	1.15	0.438	0.92	1.00	0.475	No
293	48.06	2.69	1.19	1.50	0.77	0.503	1.15	0.438	0.92	1.00	0.474	No
294	48.23	2.70	1.19	1.51	0.77	0.503	1.15	0.437	0.92	1.00	0.474	No
295	48.39	2.71	1.20	1.51	0.77	0.502	1.15	0.436	0.92	1.00	0.474	No
296	48.56	2.72	1.20	1.52	0.77	0.501	1.15	0.436	0.92	1.00	0.473	No
297	48.72	2.73	1.21	1.52	0.77	0.500	1.15	0.435	0.92	1.00	0.473	No
298	48.89	2.74	1.21	1.52	0.76	0.500	1.15	0.434	0.92	1.00	0.472	No
299	49.05	2.75	1.22	1.53	0.76	0.499	1.15	0.434	0.92	1.00	0.472	No
300	49.21	2.75	1.22	1.53	0.76	0.498	1.15	0.433	0.92	1.00	0.472	No
301	49.38	2.76	1.23	1.54	0.76	0.497	1.15	0.432	0.92	1.00	0.471	No
302	49.54	2.77	1.23	1.54	0.76	0.497	1.15	0.432	0.92	1.00	0.471	No
303	49.71	2.78	1.24	1.54	0.76	0.496	1.15	0.431	0.92	1.00	0.470	No
304	49.87	2.79	1.24	1.55	0.75	0.495	1.15	0.430	0.92	1.00	0.470	No
305	50.03	2.80	1.25	1.55	0.75	0.494	1.15	0.430	0.92	1.00	0.469	No
306	50.20	2.81	1.25	1.55	0.75	0.494	1.15	0.429	0.92	1.00	0.469	No

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1	0.16	732.61	1.07	0.57	0.50	1177.02	1.00	1177.02	4.000	No	No	2.00
2	0.33	819.70	1.11	0.64	0.50	1316.93	1.00	1316.93	4.000	No	No	2.00
3	0.49	835.97	1.17	0.76	0.50	1343.05	1.00	1343.05	4.000	No	No	2.00
4	0.66	718.50	1.26	0.89	0.50	1154.30	1.00	1154.30	4.000	No	No	2.00
5	0.82	508.68	1.39	1.06	0.50	817.18	1.00	817.18	4.000	No	No	2.00
6	0.98	329.49	1.52	1.21	0.50	529.26	1.00	529.26	4.000	No	No	2.00
7	1.15	186.71	1.75	1.55	0.53	299.84	1.07	320.46	4.000	Yes	No	2.00
8	1.31	96.97	2.03	2.16	0.64	155.65	1.34	209.15	4.000	Yes	No	2.00
9	1.48	43.97	2.42	3.54	0.79	70.48	2.40	168.89	4.000	Yes	No	2.00
10	1.64	23.25	2.67	4.23	0.88	37.18	3.78	140.41	4.000	Yes	Yes	2.00
11	1.80	17.70	2.71	3.55	0.90	28.25	4.03	113.97	4.000	No	Yes	2.00
12	1.97	15.25	2.70	2.93	0.90	24.30	4.01	97.33	4.000	No	Yes	2.00
13	2.13	14.18	2.71	2.71	0.90	22.57	4.04	91.07	4.000	No	Yes	2.00
14	2.30	13.31	2.72	2.60	0.90	21.16	4.12	87.14	4.000	No	Yes	2.00
15	2.46	12.91	2.72	2.55	0.90	20.50	4.17	85.38	4.000	No	Yes	2.00
16	2.63	13.47	2.70	2.44	0.89	21.39	3.97	84.96	4.000	No	Yes	2.00
17	2.79	13.96	2.72	2.82	0.90	22.15	4.16	92.19	4.000	Yes	Yes	2.00
18	2.95	14.73	2.66	2.39	0.88	23.38	3.72	86.93	4.000	Yes	Yes	2.00
19	3.12	27.27	2.39	1.95	0.78	43.50	2.29	99.50	4.000	Yes	No	2.00
20	3.28	38.94	2.23	1.66	0.72	62.25	1.74	108.38	4.000	Yes	No	2.00
21	3.45	39.50	2.32	2.32	0.75	63.13	2.02	127.62	4.000	Yes	No	2.00
22	3.61	30.78	2.45	2.68	0.80	49.10	2.51	123.13	4.000	Yes	No	2.00
23	3.77	20.63	2.66	3.63	0.88	32.77	3.74	122.45	4.000	Yes	Yes	2.00
24	3.94	20.75	2.59	2.80	0.85	32.96	3.25	107.04	4.000	No	No	2.00
25	4.10	19.73	2.58	2.57	0.85	31.31	3.21	100.47	4.000	No	No	2.00
26	4.27	18.72	2.55	2.14	0.84	29.67	3.02	89.74	4.000	No	No	2.00
27	4.43	16.02	2.56	1.80	0.84	25.31	3.09	78.15	4.000	No	No	2.00
28	4.59	10.82	2.71	1.86	0.90	16.95	4.08	69.08	4.000	No	Yes	2.00
29	4.76	8.13	2.83	1.91	0.94	12.60	5.00	63.07	4.000	No	Yes	2.00
30	4.92	7.71	2.86	2.01	0.96	11.93	5.29	63.08	4.000	No	Yes	2.00
31	5.09	7.70	2.89	2.35	0.97	11.90	5.65	67.16	4.000	No	Yes	2.00
32	5.25	7.55	2.93	2.64	0.98	11.63	6.01	69.97	4.000	No	Yes	2.00
33	5.41	7.01	2.97	2.80	1.00	10.76	6.46	69.49	4.000	No	Yes	2.00
34	5.58	6.79	2.98	2.77	1.00	10.39	6.56	68.17	4.000	No	Yes	2.00
35	5.74	6.81	2.99	2.83	1.00	10.41	6.61	68.84	4.000	No	Yes	2.00
36	5.91	7.54	2.94	2.70	0.99	11.57	6.09	70.47	4.000	No	Yes	2.00
37	6.07	7.68	2.94	2.78	0.99	11.78	6.10	71.82	4.000	No	Yes	2.00
38	6.23	7.83	2.94	2.84	0.99	12.01	6.08	73.04	4.000	No	Yes	2.00
39	6.40	7.65	2.97	3.07	1.00	11.71	6.38	74.66	4.000	No	Yes	2.00
40	6.56	7.62	2.96	3.00	1.00	11.64	6.33	73.75	4.000	No	Yes	2.00
41	6.73	7.17	2.99	3.00	1.00	10.91	6.58	71.85	4.000	No	Yes	2.00
42	6.89	6.34	3.03	3.02	1.00	9.56	7.14	68.22	4.000	No	Yes	2.00
43	7.05	5.43	3.11	3.16	1.00	8.08	8.00	64.67	4.000	No	Yes	2.00
44	7.22	4.95	3.13	2.99	1.00	7.30	8.31	60.63	4.000	No	Yes	2.00
45	7.38	5.51	3.03	2.38	1.00	8.19	7.13	58.43	4.000	No	Yes	2.00
46	7.55	6.10	2.97	2.12	1.00	9.13	6.40	58.39	4.000	No	Yes	2.00
47	7.71	6.36	2.92	1.88	0.98	9.52	5.95	56.60	4.000	No	Yes	2.00
48	7.87	5.65	2.96	1.80	1.00	8.37	6.35	53.16	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
49	8.04	5.09	2.97	1.52	1.00	7.46	6.43	47.92	4.000	No	Yes	2.00
50	8.20	4.71	2.97	1.29	1.00	6.84	6.44	44.04	4.000	No	Yes	2.00
51	8.37	4.48	2.97	1.13	1.00	6.45	6.40	41.30	4.000	No	Yes	2.00
52	8.53	4.35	2.97	1.03	1.00	6.23	6.37	39.65	4.000	No	Yes	2.00
53	8.69	4.27	2.96	0.94	0.99	6.09	6.29	38.33	4.000	No	Yes	2.00
54	8.86	4.18	2.96	0.91	1.00	5.93	6.34	37.61	4.000	No	Yes	2.00
55	9.02	4.09	2.96	0.86	1.00	5.78	6.35	36.66	4.000	No	Yes	2.00
56	9.19	3.98	2.97	0.83	1.00	5.59	6.42	35.92	4.000	No	Yes	2.00
57	9.35	3.89	2.98	0.83	1.00	5.43	6.55	35.56	4.000	No	Yes	2.00
58	9.51	3.81	3.06	1.21	1.00	5.29	7.43	39.30	4.000	No	Yes	2.00
59	9.68	4.21	3.12	1.99	1.00	5.92	8.12	48.08	4.000	No	Yes	2.00
60	9.84	4.81	3.16	3.13	1.00	6.87	8.74	60.04	4.000	No	Yes	2.00
61	10.01	5.63	3.15	3.90	1.00	8.18	8.61	70.47	4.000	No	Yes	2.00
62	10.17	6.46	3.12	4.27	1.00	9.50	8.24	78.24	4.000	No	Yes	2.00
63	10.34	7.18	3.09	4.31	1.00	10.65	7.77	82.69	4.000	No	Yes	2.00
64	10.50	7.57	3.07	4.42	1.00	11.25	7.61	85.63	4.000	No	Yes	2.00
65	10.66	7.52	3.07	4.35	1.00	11.17	7.59	84.75	4.000	No	Yes	2.00
66	10.83	7.36	3.20	6.75	1.00	10.90	9.26	100.92	4.000	No	Yes	2.00
67	10.99	16.27	2.79	4.13	0.93	25.19	4.66	117.48	4.000	No	Yes	2.00
68	11.16	19.75	2.74	4.45	0.91	30.77	4.32	133.04	4.000	No	Yes	2.00
69	11.32	21.17	2.66	3.66	0.88	33.03	3.74	123.43	4.000	No	Yes	2.00
70	11.48	13.24	2.89	4.63	0.97	20.28	5.60	113.53	4.000	No	Yes	2.00
71	11.65	10.95	2.92	4.13	0.98	16.58	5.94	98.51	4.000	No	Yes	2.00
72	11.81	10.97	2.91	3.99	0.98	16.59	5.84	96.94	4.000	No	Yes	2.00
73	11.98	11.30	2.91	4.03	0.98	17.11	5.77	98.70	4.000	No	Yes	2.00
74	12.14	11.03	2.93	4.30	0.99	16.67	6.03	100.57	4.000	No	Yes	2.00
75	12.30	10.30	2.99	4.90	1.00	15.48	6.68	103.44	4.000	No	Yes	2.00
76	12.47	10.59	3.00	5.16	1.00	15.93	6.74	107.34	4.000	Yes	Yes	2.00
77	12.63	12.13	2.94	4.90	0.99	18.39	6.08	111.80	4.000	Yes	Yes	2.00
78	12.80	15.19	2.82	4.23	0.94	23.19	4.95	114.84	4.000	Yes	Yes	2.00
79	12.96	18.96	2.71	3.69	0.90	28.40	4.11	116.59	4.000	Yes	Yes	2.00
80	13.12	26.93	2.55	2.95	0.84	39.12	3.01	117.90	4.000	Yes	No	2.00
81	13.29	37.66	2.36	2.13	0.77	52.67	2.14	112.76	4.000	Yes	No	2.00
82	13.45	48.57	2.18	1.47	0.70	65.44	1.61	105.68	4.000	Yes	No	2.00
83	13.62	57.60	2.01	0.94	0.63	74.89	1.32	98.57	4.000	Yes	No	2.00
84	13.78	65.10	1.90	0.68	0.59	82.50	1.19	97.93	4.000	Yes	No	2.00
85	13.94	70.82	1.81	0.53	0.56	88.04	1.12	98.40	4.000	Yes	No	2.00
86	14.11	69.64	1.78	0.43	0.54	85.61	1.00	85.61	0.138	No	No	0.38
87	14.27	62.77	1.77	0.33	0.54	76.68	1.00	76.68	0.122	No	No	0.33
88	14.44	57.04	1.80	0.31	0.55	69.74	1.00	69.74	0.112	No	No	0.30
89	14.60	57.39	1.83	0.39	0.57	70.42	1.00	70.42	0.112	No	No	0.30
90	14.76	64.30	1.78	0.36	0.55	77.98	1.00	77.98	0.124	No	No	0.33
91	14.93	70.18	1.72	0.32	0.52	84.07	1.00	84.07	0.135	No	No	0.36
92	15.09	74.76	1.66	0.25	0.50	88.39	1.00	88.39	0.144	No	No	0.38
93	15.26	75.18	1.76	0.42	0.54	90.06	1.00	90.06	0.148	No	No	0.39
94	15.42	75.76	1.83	0.60	0.56	91.58	1.13	103.34	0.183	No	No	0.48
95	15.58	79.80	1.85	0.69	0.57	96.41	1.14	110.02	0.204	No	No	0.53
96	15.75	86.62	1.78	0.58	0.54	103.12	1.09	112.32	0.212	No	No	0.55

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
97	15.91	94.08	1.67	0.41	0.50	109.82	1.00	109.82	0.203	No	No	0.52
98	16.08	94.39	1.62	0.32	0.50	109.61	1.00	109.61	0.202	No	No	0.52
99	16.24	90.80	1.67	0.37	0.50	105.22	1.00	105.22	0.188	No	No	0.48
100	16.40	88.00	1.77	0.57	0.54	103.32	1.09	112.40	4.000	Yes	No	2.00
101	16.57	89.72	1.92	1.06	0.60	107.45	1.21	130.23	4.000	Yes	No	2.00
102	16.73	81.84	2.05	1.52	0.65	99.46	1.38	136.95	4.000	Yes	No	2.00
103	16.90	59.51	2.26	2.26	0.73	74.01	1.84	136.21	4.000	Yes	No	2.00
104	17.06	33.50	2.53	3.07	0.83	42.61	2.93	124.74	4.000	Yes	No	2.00
105	17.22	18.83	2.80	4.15	0.93	24.22	4.79	115.91	4.000	Yes	Yes	2.00
106	17.39	16.62	2.83	3.98	0.95	21.19	5.06	107.32	4.000	No	Yes	2.00
107	17.55	16.13	2.85	4.10	0.95	20.46	5.25	107.36	4.000	No	Yes	2.00
108	17.72	15.52	2.87	4.15	0.96	19.58	5.41	105.95	4.000	No	Yes	2.00
109	17.88	15.24	2.86	3.94	0.96	19.07	5.36	102.22	4.000	No	Yes	2.00
110	18.05	14.94	2.86	3.80	0.96	18.56	5.35	99.25	4.000	No	Yes	2.00
111	18.21	14.54	2.87	3.78	0.96	17.94	5.45	97.71	4.000	No	Yes	2.00
112	18.37	13.86	2.89	3.70	0.97	16.96	5.57	94.45	4.000	No	Yes	2.00
113	18.54	13.36	2.89	3.50	0.97	16.21	5.57	90.33	4.000	No	Yes	2.00
114	18.70	13.29	2.88	3.31	0.96	16.00	5.48	87.63	4.000	No	Yes	2.00
115	18.87	13.88	2.86	3.26	0.96	16.64	5.31	88.36	4.000	No	Yes	2.00
116	19.03	14.82	2.85	3.36	0.95	17.73	5.18	91.90	4.000	No	Yes	2.00
117	19.19	16.33	2.80	3.21	0.94	19.46	4.80	93.38	4.000	No	Yes	2.00
118	19.36	16.64	2.80	3.21	0.93	19.74	4.76	93.94	4.000	No	Yes	2.00
119	19.52	15.87	2.82	3.21	0.94	18.70	4.92	91.92	4.000	No	Yes	2.00
120	19.69	14.20	2.86	3.30	0.96	16.59	5.35	88.75	4.000	No	Yes	2.00
121	19.85	13.00	2.89	3.24	0.97	15.04	5.63	84.62	4.000	No	Yes	2.00
122	20.01	11.95	2.92	3.11	0.98	13.67	5.85	80.00	4.000	No	Yes	2.00
123	20.18	10.81	2.94	2.97	0.99	12.21	6.14	74.95	4.000	No	Yes	2.00
124	20.34	9.63	2.98	2.88	1.00	10.70	6.55	70.14	4.000	No	Yes	2.00
125	20.51	9.03	2.99	2.69	1.00	9.89	6.68	66.10	4.000	No	Yes	2.00
126	20.67	9.08	2.98	2.56	1.00	9.89	6.55	64.78	4.000	No	Yes	2.00
127	20.83	9.66	2.95	2.45	0.99	10.54	6.19	65.22	4.000	No	Yes	2.00
128	21.00	10.30	2.93	2.48	0.98	11.25	5.98	67.22	4.000	No	Yes	2.00
129	21.16	11.08	2.90	2.51	0.97	12.11	5.74	69.60	4.000	No	Yes	2.00
130	21.33	11.67	2.89	2.56	0.97	12.75	5.61	71.48	4.000	No	Yes	2.00
131	21.49	12.07	2.88	2.55	0.96	13.16	5.49	72.28	4.000	No	Yes	2.00
132	21.65	12.09	2.88	2.60	0.97	13.12	5.55	72.79	4.000	No	Yes	2.00
133	21.82	12.26	2.89	2.68	0.97	13.27	5.58	74.02	4.000	No	Yes	2.00
134	21.98	12.37	2.90	2.78	0.97	13.34	5.65	75.42	4.000	No	Yes	2.00
135	22.15	12.13	2.92	2.94	0.98	13.01	5.88	76.44	4.000	No	Yes	2.00
136	22.31	11.63	2.94	3.02	0.99	12.38	6.13	75.87	4.000	No	Yes	2.00
137	22.47	11.17	2.96	3.02	1.00	11.78	6.31	74.33	4.000	No	Yes	2.00
138	22.64	11.15	2.95	2.91	0.99	11.69	6.24	72.98	4.000	No	Yes	2.00
139	22.80	11.42	2.94	2.79	0.99	11.93	6.05	72.23	4.000	No	Yes	2.00
140	22.97	12.27	2.90	2.72	0.97	12.83	5.73	73.52	4.000	No	Yes	2.00
141	23.13	13.30	2.89	2.85	0.97	13.94	5.56	77.52	4.000	No	Yes	2.00
142	23.29	15.00	2.85	2.95	0.95	15.79	5.24	82.66	4.000	No	Yes	2.00
143	23.46	16.81	2.81	2.92	0.94	17.72	4.86	86.03	4.000	No	Yes	2.00
144	23.62	17.64	2.79	2.95	0.93	18.56	4.74	87.99	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
145	23.79	16.70	2.84	3.18	0.95	17.45	5.10	89.02	4.000	No	Yes	2.00
146	23.95	14.59	2.91	3.51	0.98	15.07	5.82	87.74	4.000	No	Yes	2.00
147	24.11	13.17	2.96	3.61	1.00	13.43	6.31	84.77	4.000	No	Yes	2.00
148	24.28	13.66	2.94	3.48	0.99	13.89	6.09	84.58	4.000	No	Yes	2.00
149	24.44	16.51	2.87	3.41	0.96	16.94	5.37	90.92	4.000	No	Yes	2.00
150	24.61	19.84	2.81	3.56	0.94	20.48	4.89	100.11	4.000	No	Yes	2.00
151	24.77	24.04	2.74	3.52	0.91	24.90	4.33	107.83	4.000	No	Yes	2.00
152	24.93	28.07	2.68	3.37	0.89	29.07	3.86	112.16	4.000	No	Yes	2.00
153	25.10	29.68	2.66	3.29	0.88	30.62	3.70	113.16	4.000	No	Yes	2.00
154	25.26	28.08	2.67	3.26	0.89	28.79	3.82	109.84	4.000	No	Yes	2.00
155	25.43	23.23	2.75	3.33	0.91	23.54	4.36	102.52	4.000	No	Yes	2.00
156	25.59	19.44	2.80	3.21	0.94	19.41	4.80	93.21	4.000	No	Yes	2.00
157	25.76	17.14	2.84	3.13	0.95	16.90	5.17	87.31	4.000	No	Yes	2.00
158	25.92	16.53	2.87	3.25	0.96	16.18	5.39	87.20	4.000	No	Yes	2.00
159	26.08	16.48	2.89	3.51	0.97	16.07	5.61	90.12	4.000	No	Yes	2.00
160	26.25	16.05	2.92	3.70	0.98	15.55	5.86	91.15	4.000	No	Yes	2.00
161	26.41	15.78	2.93	3.75	0.98	15.20	5.98	90.84	4.000	No	Yes	2.00
162	26.58	16.43	2.90	3.53	0.97	15.79	5.68	89.69	4.000	No	Yes	2.00
163	26.74	17.80	2.87	3.55	0.96	17.14	5.43	92.99	4.000	No	Yes	2.00
164	26.90	20.61	2.81	3.42	0.94	19.94	4.88	97.20	4.000	No	Yes	2.00
165	27.07	22.02	2.80	3.56	0.93	21.30	4.78	101.82	4.000	No	Yes	2.00
166	27.23	24.98	2.74	3.39	0.91	24.20	4.32	104.59	4.000	No	Yes	2.00
167	27.40	26.11	2.74	3.54	0.91	25.25	4.30	108.67	4.000	No	Yes	2.00
168	27.56	27.59	2.72	3.53	0.90	26.62	4.17	110.90	4.000	No	Yes	2.00
169	27.72	24.73	2.79	3.88	0.93	23.65	4.69	110.85	4.000	No	Yes	2.00
170	27.89	22.20	2.83	3.95	0.95	21.00	5.07	106.50	4.000	No	Yes	2.00
171	28.05	19.91	2.88	3.99	0.96	18.61	5.47	101.80	4.000	No	Yes	2.00
172	28.22	19.53	2.88	3.89	0.96	18.13	5.48	99.44	4.000	No	Yes	2.00
173	28.38	18.59	2.91	4.03	0.98	17.11	5.77	98.74	4.000	No	Yes	2.00
174	28.54	18.53	2.90	3.86	0.97	16.97	5.68	96.43	4.000	No	Yes	2.00
175	28.71	18.91	2.87	3.50	0.96	17.26	5.37	92.66	4.000	No	Yes	2.00
176	28.87	19.48	2.83	3.23	0.95	17.74	5.09	90.24	4.000	No	Yes	2.00
177	29.04	19.42	2.87	3.64	0.96	17.61	5.41	95.22	4.000	No	Yes	2.00
178	29.20	22.14	2.81	3.51	0.94	20.19	4.90	98.88	4.000	No	Yes	2.00
179	29.36	22.46	2.84	3.85	0.95	20.42	5.09	103.91	4.000	No	Yes	2.00
180	29.53	23.78	2.81	3.72	0.94	21.60	4.84	104.58	4.000	No	Yes	2.00
181	29.69	23.03	2.82	3.78	0.94	20.78	4.99	103.82	4.000	No	Yes	2.00
182	29.86	22.49	2.81	3.48	0.94	20.16	4.88	98.43	4.000	No	Yes	2.00
183	30.02	20.18	2.84	3.37	0.95	17.86	5.17	92.31	4.000	No	Yes	2.00
184	30.18	17.12	2.93	3.69	0.98	14.85	6.01	89.22	4.000	No	Yes	2.00
185	30.35	15.81	2.99	4.06	1.00	13.53	6.62	89.59	4.000	No	Yes	2.00
186	30.51	15.20	3.02	4.27	1.00	12.88	6.96	89.62	4.000	No	Yes	2.00
187	30.68	14.12	3.06	4.38	1.00	11.80	7.39	87.18	4.000	No	Yes	2.00
188	30.84	13.33	3.06	4.10	1.00	11.00	7.47	82.17	4.000	No	Yes	2.00
189	31.00	13.59	3.04	3.84	1.00	11.19	7.20	80.53	4.000	No	Yes	2.00
190	31.17	14.12	3.02	3.76	1.00	11.65	6.97	81.19	4.000	No	Yes	2.00
191	31.33	15.08	3.01	3.89	1.00	12.49	6.80	84.94	4.000	No	Yes	2.00
192	31.50	15.32	3.02	4.16	1.00	12.65	6.95	87.92	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
193	31.66	16.56	2.98	3.99	1.00	13.75	6.51	89.51	4.000	No	Yes	2.00
194	31.82	18.38	2.90	3.49	0.97	15.38	5.74	88.32	4.000	No	Yes	2.00
195	31.99	19.93	2.84	3.11	0.95	16.75	5.17	86.66	4.000	No	Yes	2.00
196	32.15	23.58	2.76	2.91	0.92	20.05	4.49	90.09	4.000	No	Yes	2.00
197	32.32	28.50	2.69	2.87	0.89	24.50	3.95	96.70	4.000	No	Yes	2.00
198	32.48	30.57	2.67	2.90	0.89	26.30	3.80	99.94	4.000	No	Yes	2.00
199	32.64	28.23	2.71	2.97	0.90	24.06	4.06	97.70	4.000	No	Yes	2.00
200	32.81	23.18	2.81	3.26	0.94	19.34	4.85	93.79	4.000	No	Yes	2.00
201	32.97	19.81	2.88	3.41	0.96	16.21	5.51	89.24	4.000	No	Yes	2.00
202	33.14	17.47	2.95	3.66	0.99	14.01	6.19	86.78	4.000	No	Yes	2.00
203	33.30	15.34	3.01	3.83	1.00	12.05	6.89	83.00	4.000	No	Yes	2.00
204	33.47	13.75	3.07	3.96	1.00	10.58	7.52	79.62	4.000	No	Yes	2.00
205	33.63	12.58	3.10	3.90	1.00	9.50	7.94	75.40	4.000	No	Yes	2.00
206	33.79	12.19	3.09	3.58	1.00	9.12	7.85	71.55	4.000	No	Yes	2.00
207	33.96	12.16	3.08	3.30	1.00	9.05	7.63	69.05	4.000	No	Yes	2.00
208	34.12	12.21	3.06	3.14	1.00	9.06	7.48	67.76	4.000	No	Yes	2.00
209	34.28	12.15	3.07	3.23	1.00	8.97	7.61	68.24	4.000	No	Yes	2.00
210	34.45	12.01	3.11	3.60	1.00	8.81	8.02	70.65	4.000	No	Yes	2.00
211	34.61	11.80	3.15	4.15	1.00	8.58	8.60	73.83	4.000	No	Yes	2.00
212	34.78	11.66	3.18	4.59	1.00	8.43	9.03	76.15	4.000	No	Yes	2.00
213	34.94	12.10	3.18	4.73	1.00	8.77	8.95	78.52	4.000	No	Yes	2.00
214	35.11	12.77	3.16	4.74	1.00	9.31	8.68	80.82	4.000	No	Yes	2.00
215	35.27	12.93	3.16	4.85	1.00	9.41	8.72	82.00	4.000	No	Yes	2.00
216	35.43	12.69	3.17	4.85	1.00	9.16	8.84	80.94	4.000	No	Yes	2.00
217	35.60	12.53	3.17	4.68	1.00	8.98	8.80	79.07	4.000	No	Yes	2.00
218	35.76	13.35	3.12	4.33	1.00	9.65	8.21	79.23	4.000	No	Yes	2.00
219	35.93	15.45	3.05	4.07	1.00	11.38	7.30	83.09	4.000	No	Yes	2.00
220	36.09	18.11	2.99	4.07	1.00	13.57	6.62	89.81	4.000	No	Yes	2.00
221	36.25	20.88	2.94	4.12	0.99	15.86	6.08	96.51	4.000	No	Yes	2.00
222	36.42	22.88	2.91	4.19	0.98	17.50	5.80	101.45	4.000	No	Yes	2.00
223	36.58	24.09	2.89	4.09	0.97	18.45	5.56	102.63	4.000	No	Yes	2.00
224	36.75	24.99	2.86	3.86	0.96	19.16	5.29	101.41	4.000	No	Yes	2.00
225	36.91	26.08	2.82	3.57	0.94	20.02	4.96	99.35	4.000	No	Yes	2.00
226	37.07	27.78	2.78	3.34	0.93	21.40	4.62	98.80	4.000	No	Yes	2.00
227	37.24	29.98	2.75	3.30	0.92	23.18	4.37	101.41	4.000	No	Yes	2.00
228	37.40	33.96	2.70	3.25	0.90	26.46	4.01	106.00	4.000	No	Yes	2.00
229	37.57	38.81	2.65	3.22	0.88	30.45	3.67	111.67	4.000	No	Yes	2.00
230	37.73	41.93	2.62	3.18	0.87	32.98	3.47	114.52	4.000	No	Yes	2.00
231	37.89	43.07	2.62	3.23	0.87	33.80	3.45	116.58	4.000	No	Yes	2.00
232	38.06	42.24	2.63	3.20	0.87	32.99	3.48	114.90	4.000	No	Yes	2.00
233	38.22	41.54	2.63	3.16	0.87	32.29	3.50	113.06	4.000	No	Yes	2.00
234	38.39	41.31	2.61	2.92	0.86	32.03	3.38	108.26	4.000	No	Yes	2.00
235	38.55	40.24	2.61	2.86	0.86	31.03	3.40	105.67	4.000	No	Yes	2.00
236	38.71	39.45	2.60	2.69	0.86	30.31	3.35	101.58	4.000	No	Yes	2.00
237	38.88	37.05	2.63	2.73	0.87	28.21	3.53	99.49	4.000	No	Yes	2.00
238	39.04	35.01	2.65	2.72	0.88	26.42	3.67	96.87	4.000	No	Yes	2.00
239	39.21	32.19	2.70	2.82	0.89	24.00	3.96	95.15	4.000	No	Yes	2.00
240	39.37	29.71	2.73	2.84	0.91	21.89	4.21	92.05	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
241	39.53	28.89	2.72	2.63	0.90	21.18	4.14	87.61	4.000	No	Yes	2.00
242	39.70	26.85	2.75	2.62	0.91	19.45	4.35	84.69	4.000	No	Yes	2.00
243	39.86	24.35	2.79	2.64	0.93	17.36	4.69	81.47	4.000	No	Yes	2.00
244	40.03	21.26	2.86	2.76	0.96	14.81	5.28	78.22	4.000	No	Yes	2.00
245	40.19	20.00	2.85	2.44	0.95	13.79	5.24	72.23	4.000	No	Yes	2.00
246	40.35	18.63	2.86	2.20	0.96	12.67	5.28	66.89	4.000	No	Yes	2.00
247	40.52	16.69	2.89	2.07	0.97	11.11	5.60	62.19	4.000	No	Yes	2.00
248	40.68	15.28	2.94	2.15	0.99	9.95	6.09	60.60	4.000	No	Yes	2.00
249	40.85	15.10	2.95	2.19	0.99	9.76	6.21	60.65	4.000	No	Yes	2.00
250	41.01	16.04	2.98	2.77	1.00	10.42	6.56	68.31	4.000	No	Yes	2.00
251	41.18	19.93	2.95	3.49	0.99	13.34	6.24	83.32	4.000	No	Yes	2.00
252	41.34	42.82	2.63	3.12	0.87	31.40	3.54	111.18	4.000	No	Yes	2.00
253	41.50	65.29	2.48	3.00	0.81	49.32	2.66	130.97	0.289	No	No	0.60
254	41.67	75.04	2.45	3.13	0.80	56.92	2.51	142.86	0.351	No	No	0.72
255	41.83	63.28	2.51	3.24	0.83	47.28	2.84	134.13	0.304	No	No	0.63
256	42.00	45.74	2.65	3.45	0.88	33.15	3.62	119.84	4.000	No	Yes	2.00
257	42.16	37.99	2.66	2.84	0.88	27.11	3.69	100.01	4.000	No	Yes	2.00
258	42.32	31.93	2.70	2.65	0.90	22.33	4.02	89.78	4.000	No	Yes	2.00
259	42.49	28.16	2.73	2.47	0.91	19.36	4.25	82.25	4.000	No	Yes	2.00
260	42.65	24.03	2.82	2.63	0.94	16.08	4.91	79.01	4.000	No	Yes	2.00
261	42.82	20.94	2.89	2.77	0.97	13.64	5.57	75.92	4.000	No	Yes	2.00
262	42.98	20.43	2.90	2.75	0.97	13.21	5.66	74.79	4.000	No	Yes	2.00
263	43.14	20.44	2.91	2.87	0.98	13.16	5.78	76.02	4.000	No	Yes	2.00
264	43.31	20.19	2.94	3.14	0.99	12.89	6.09	78.44	4.000	No	Yes	2.00
265	43.47	20.79	2.94	3.28	0.99	13.27	6.09	80.82	4.000	No	Yes	2.00
266	43.64	21.56	2.93	3.38	0.99	13.79	6.03	83.19	4.000	No	Yes	2.00
267	43.80	22.32	2.93	3.43	0.98	14.30	5.95	85.06	4.000	No	Yes	2.00
268	43.96	22.39	2.93	3.51	0.98	14.30	6.01	85.92	4.000	No	Yes	2.00
269	44.13	21.71	2.95	3.61	0.99	13.72	6.23	85.52	4.000	No	Yes	2.00
270	44.29	20.49	2.99	3.76	1.00	12.78	6.61	84.46	4.000	No	Yes	2.00
271	44.46	19.29	3.02	3.87	1.00	11.89	6.98	82.96	4.000	No	Yes	2.00
272	44.62	18.16	3.06	4.02	1.00	11.05	7.38	81.59	4.000	No	Yes	2.00
273	44.78	17.31	3.08	4.13	1.00	10.41	7.73	80.42	4.000	No	Yes	2.00
274	44.95	16.91	3.10	4.17	1.00	10.09	7.89	79.63	4.000	No	Yes	2.00
275	45.11	17.00	3.10	4.21	1.00	10.12	7.90	79.97	4.000	No	Yes	2.00
276	45.28	17.47	3.08	4.00	1.00	10.41	7.62	79.38	4.000	No	Yes	2.00
277	45.44	17.54	3.06	3.82	1.00	10.43	7.47	77.88	4.000	No	Yes	2.00
278	45.60	17.16	3.04	3.37	1.00	10.13	7.21	73.04	4.000	No	Yes	2.00
279	45.77	16.26	3.04	3.03	1.00	9.47	7.19	68.02	4.000	No	Yes	2.00
280	45.93	15.53	3.03	2.72	1.00	8.93	7.13	63.70	4.000	No	Yes	2.00
281	46.10	15.20	3.04	2.64	1.00	8.68	7.17	62.22	4.000	No	Yes	2.00
282	46.26	15.10	3.06	2.87	1.00	8.58	7.45	63.95	4.000	No	Yes	2.00
283	46.42	16.17	3.04	2.98	1.00	9.28	7.22	67.06	4.000	No	Yes	2.00
284	46.59	18.27	3.00	3.02	1.00	10.68	6.69	71.47	4.000	No	Yes	2.00
285	46.75	20.78	2.92	2.73	0.98	12.44	5.85	72.82	4.000	No	Yes	2.00
286	46.92	21.44	2.92	2.88	0.98	12.85	5.87	75.42	4.000	No	Yes	2.00
287	47.08	21.27	2.95	3.17	0.99	12.64	6.18	78.11	4.000	No	Yes	2.00
288	47.24	20.53	3.01	3.75	1.00	12.06	6.83	82.36	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
289	47.41	20.40	3.02	3.84	1.00	11.93	6.94	82.77	4.000	No	Yes	2.00
290	47.57	19.58	3.03	3.70	1.00	11.34	7.03	79.73	4.000	No	Yes	2.00
291	47.74	18.70	3.02	3.32	1.00	10.72	6.94	74.41	4.000	No	Yes	2.00
292	47.90	18.35	3.00	3.04	1.00	10.45	6.80	70.99	4.000	No	Yes	2.00
293	48.06	19.06	2.97	2.86	1.00	10.89	6.46	70.36	4.000	No	Yes	2.00
294	48.23	19.05	2.97	2.81	1.00	10.85	6.44	69.83	4.000	No	Yes	2.00
295	48.39	18.34	2.98	2.76	1.00	10.34	6.57	67.91	4.000	No	Yes	2.00
296	48.56	17.38	2.99	2.52	1.00	9.68	6.60	63.81	4.000	No	Yes	2.00
297	48.72	17.37	2.97	2.32	1.00	9.64	6.39	61.67	4.000	No	Yes	2.00
298	48.89	18.04	2.93	2.12	0.98	10.11	6.00	60.64	4.000	No	Yes	2.00
299	49.05	18.47	2.94	2.25	0.99	10.35	6.06	62.66	4.000	No	Yes	2.00
300	49.21	19.33	2.93	2.36	0.98	10.89	5.97	65.08	4.000	No	Yes	2.00
301	49.38	20.05	2.93	2.54	0.98	11.32	6.02	68.13	4.000	No	Yes	2.00
302	49.54	20.80	2.93	2.70	0.98	11.78	6.02	70.91	4.000	No	Yes	2.00
303	49.71	21.68	2.93	2.83	0.98	12.32	5.98	73.65	4.000	No	Yes	2.00
304	49.87	22.82	2.80	1.88	0.94	13.26	4.80	63.71	4.000	No	Yes	2.00
305	50.03	23.87	2.62	0.93	0.87	14.29	3.47	49.61	4.000	No	Yes	2.00
306	50.20	24.38	-0.98	0.00	1.00	-1.00	1.00	N/A	4.000	No	No	2.00

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
I_c: Soil behavior type index
Fr: Normalized friction ratio (%)
n: Stress exponent
Q_{tn}: Normalized cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cydic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.98	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.93	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.88	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.83	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.78	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.73	0.16	0.00	1.97	2.00	0.00	9.70	0.17	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.63	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.45	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.38	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.33	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.28	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.23	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.18	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.13	0.16	0.00	5.91	2.00	0.00	9.10	0.17	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.78	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.73	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.68	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.63	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.58	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.53	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.34	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.16	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.18	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.13	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.08	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.03	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.98	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.93	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	0.38	0.62	7.85	0.16	0.25
14.27	0.33	0.67	7.82	0.16	0.26	14.44	0.30	0.70	7.80	0.16	0.27
14.60	0.30	0.70	7.77	0.16	0.27	14.76	0.33	0.67	7.75	0.16	0.26
14.93	0.36	0.64	7.72	0.16	0.25	15.09	0.38	0.62	7.70	0.16	0.24
15.26	0.39	0.61	7.67	0.16	0.23	15.42	0.48	0.52	7.65	0.16	0.20
15.58	0.53	0.47	7.62	0.16	0.18	15.75	0.55	0.45	7.60	0.16	0.17

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	0.52	0.48	7.58	0.16	0.18	16.08	0.52	0.48	7.55	0.16	0.18
16.24	0.48	0.52	7.53	0.16	0.20	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.48	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.43	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.38	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.33	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.05	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.87	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.98	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.93	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	2.00	0.00	6.88	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.83	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	2.00	0.00	6.78	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	2.00	0.00	6.60	0.16	0.00
22.47	2.00	0.00	6.57	0.16	0.00	22.64	2.00	0.00	6.55	0.16	0.00
22.80	2.00	0.00	6.52	0.16	0.00	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.43	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.38	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.33	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.28	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.23	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.18	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.76	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.58	2.00	0.00	5.95	0.16	0.00
26.74	2.00	0.00	5.92	0.16	0.00	26.90	2.00	0.00	5.90	0.16	0.00
27.07	2.00	0.00	5.87	0.16	0.00	27.23	2.00	0.00	5.85	0.16	0.00
27.40	2.00	0.00	5.83	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.78	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.73	0.16	0.00	28.22	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.68	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.63	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.58	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.23	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.18	0.16	0.00	31.82	2.00	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.13	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.08	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.03	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.98	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.47	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	2.00	0.00	4.80	0.16	0.00
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.11	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.63	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.58	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.53	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.48	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.43	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.38	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.03	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.98	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.93	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.88	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.83	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.78	0.16	0.00	41.01	2.00	0.00	3.75	0.17	0.00
41.18	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	0.60	0.40	3.67	0.16	0.07	41.67	0.72	0.28	3.65	0.16	0.05
41.83	0.63	0.37	3.62	0.16	0.07	42.00	2.00	0.00	3.60	0.16	0.00
42.16	2.00	0.00	3.57	0.16	0.00	42.32	2.00	0.00	3.55	0.16	0.00
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.82	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.43	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.38	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.33	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.28	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.23	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.18	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00
46.42	2.00	0.00	2.92	0.16	0.00	46.59	2.00	0.00	2.90	0.16	0.00
46.75	2.00	0.00	2.87	0.16	0.00	46.92	2.00	0.00	2.85	0.16	0.00
47.08	2.00	0.00	2.83	0.16	0.00	47.24	2.00	0.00	2.80	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
47.41	2.00	0.00	2.78	0.16	0.00	47.57	2.00	0.00	2.75	0.16	0.00
47.74	2.00	0.00	2.73	0.16	0.00	47.90	2.00	0.00	2.70	0.16	0.00
48.06	2.00	0.00	2.68	0.16	0.00	48.23	2.00	0.00	2.65	0.16	0.00
48.39	2.00	0.00	2.63	0.16	0.00	48.56	2.00	0.00	2.60	0.16	0.00
48.72	2.00	0.00	2.58	0.16	0.00	48.89	2.00	0.00	2.55	0.16	0.00
49.05	2.00	0.00	2.52	0.16	0.00	49.21	2.00	0.00	2.50	0.16	0.00
49.38	2.00	0.00	2.47	0.16	0.00	49.54	2.00	0.00	2.45	0.16	0.00
49.71	2.00	0.00	2.42	0.16	0.00	49.87	2.00	0.00	2.40	0.16	0.00
50.03	2.00	0.00	2.37	0.16	0.00	50.20	2.00	0.00	2.35	0.16	0.00

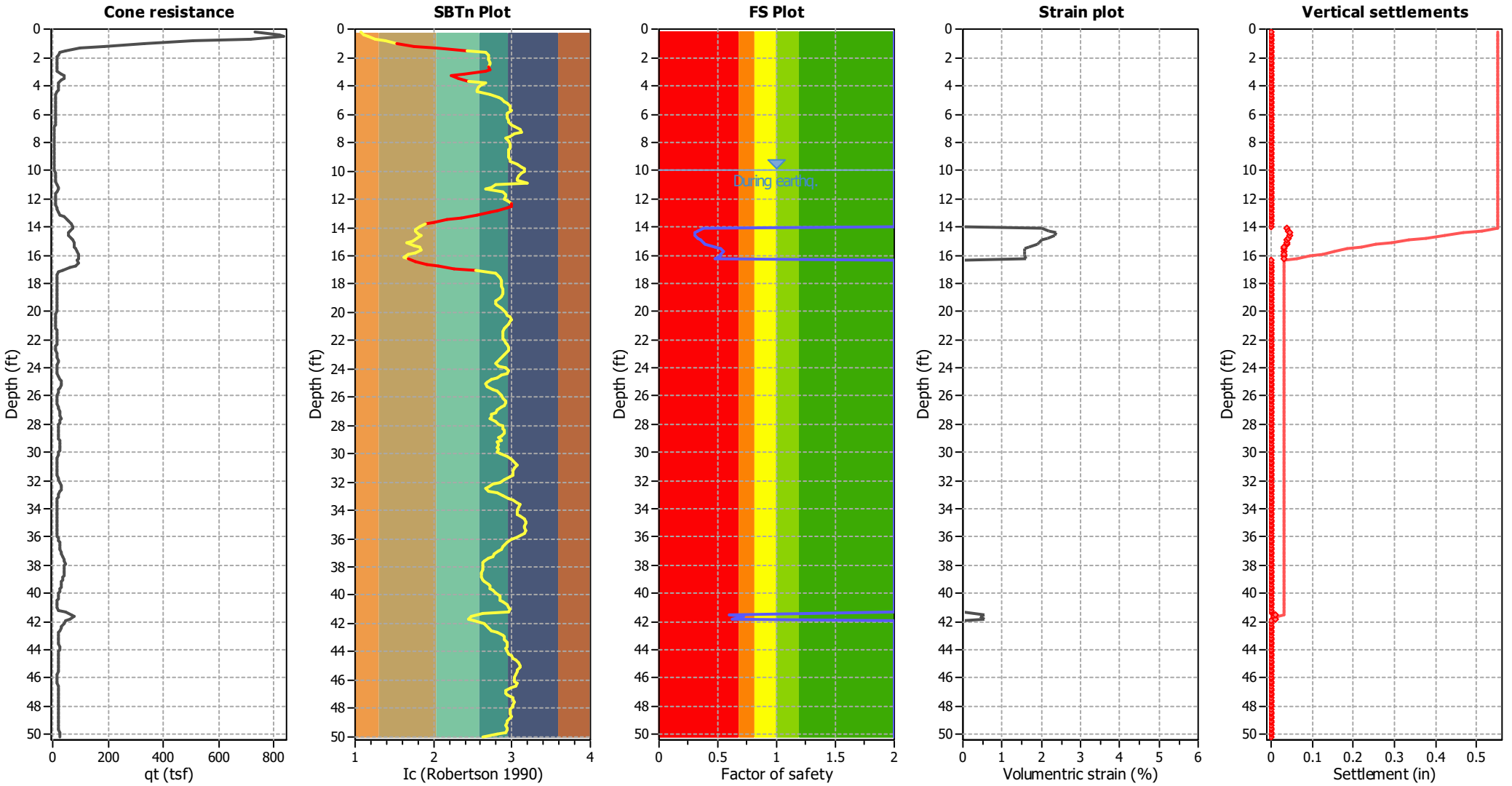
Overall liquefaction potential: 3.34

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
10.01	70.47	2.00	0.00	0.83	0.00	10.17	78.24	2.00	0.00	0.83	0.00
10.34	82.69	2.00	0.00	0.82	0.00	10.50	85.63	2.00	0.00	0.82	0.00
10.66	84.75	2.00	0.00	0.82	0.00	10.83	100.92	2.00	0.00	0.82	0.00
10.99	117.48	2.00	0.00	0.81	0.00	11.16	133.04	2.00	0.00	0.81	0.00
11.32	123.43	2.00	0.00	0.81	0.00	11.48	113.53	2.00	0.00	0.81	0.00
11.65	98.51	2.00	0.00	0.80	0.00	11.81	96.94	2.00	0.00	0.80	0.00
11.98	98.70	2.00	0.00	0.80	0.00	12.14	100.57	2.00	0.00	0.79	0.00
12.30	103.44	2.00	0.00	0.79	0.00	12.47	107.34	2.00	0.00	0.79	0.00
12.63	111.80	2.00	0.00	0.79	0.00	12.80	114.84	2.00	0.00	0.78	0.00
12.96	116.59	2.00	0.00	0.78	0.00	13.12	117.90	2.00	0.00	0.78	0.00
13.29	112.76	2.00	0.00	0.77	0.00	13.45	105.68	2.00	0.00	0.77	0.00
13.62	98.57	2.00	0.00	0.77	0.00	13.78	97.93	2.00	0.00	0.77	0.00
13.94	98.40	2.00	0.00	0.76	0.00	14.11	85.61	0.38	2.02	0.76	0.04
14.27	76.68	0.33	2.20	0.76	0.04	14.44	69.74	0.30	2.37	0.76	0.05
14.60	70.42	0.30	2.34	0.75	0.05	14.76	77.98	0.33	2.15	0.75	0.04
14.93	84.07	0.36	2.01	0.75	0.04	15.09	88.39	0.38	1.92	0.74	0.04
15.26	90.06	0.39	1.89	0.74	0.04	15.42	103.34	0.48	1.68	0.74	0.03
15.58	110.02	0.53	1.59	0.74	0.03	15.75	112.32	0.55	1.56	0.73	0.03
15.91	109.82	0.52	1.58	0.73	0.03	16.08	109.61	0.52	1.58	0.73	0.03
16.24	105.22	0.48	1.62	0.72	0.03	16.40	112.40	2.00	0.00	0.72	0.00
16.57	130.23	2.00	0.00	0.72	0.00	16.73	136.95	2.00	0.00	0.72	0.00
16.90	136.21	2.00	0.00	0.71	0.00	17.06	124.74	2.00	0.00	0.71	0.00
17.22	115.91	2.00	0.00	0.71	0.00	17.39	107.32	2.00	0.00	0.71	0.00
17.55	107.36	2.00	0.00	0.70	0.00	17.72	105.95	2.00	0.00	0.70	0.00
17.88	102.22	2.00	0.00	0.70	0.00	18.05	99.25	2.00	0.00	0.69	0.00
18.21	97.71	2.00	0.00	0.69	0.00	18.37	94.45	2.00	0.00	0.69	0.00
18.54	90.33	2.00	0.00	0.69	0.00	18.70	87.63	2.00	0.00	0.68	0.00
18.87	88.36	2.00	0.00	0.68	0.00	19.03	91.90	2.00	0.00	0.68	0.00
19.19	93.38	2.00	0.00	0.67	0.00	19.36	93.94	2.00	0.00	0.67	0.00
19.52	91.92	2.00	0.00	0.67	0.00	19.69	88.75	2.00	0.00	0.67	0.00
19.85	84.62	2.00	0.00	0.66	0.00	20.01	80.00	2.00	0.00	0.66	0.00
20.18	74.95	2.00	0.00	0.66	0.00	20.34	70.14	2.00	0.00	0.66	0.00
20.51	66.10	2.00	0.00	0.65	0.00	20.67	64.78	2.00	0.00	0.65	0.00
20.83	65.22	2.00	0.00	0.65	0.00	21.00	67.22	2.00	0.00	0.64	0.00
21.16	69.60	2.00	0.00	0.64	0.00	21.33	71.48	2.00	0.00	0.64	0.00
21.49	72.28	2.00	0.00	0.64	0.00	21.65	72.79	2.00	0.00	0.63	0.00
21.82	74.02	2.00	0.00	0.63	0.00	21.98	75.42	2.00	0.00	0.63	0.00
22.15	76.44	2.00	0.00	0.62	0.00	22.31	75.87	2.00	0.00	0.62	0.00
22.47	74.33	2.00	0.00	0.62	0.00	22.64	72.98	2.00	0.00	0.62	0.00
22.80	72.23	2.00	0.00	0.61	0.00	22.97	73.52	2.00	0.00	0.61	0.00
23.13	77.52	2.00	0.00	0.61	0.00	23.29	82.66	2.00	0.00	0.61	0.00
23.46	86.03	2.00	0.00	0.60	0.00	23.62	87.99	2.00	0.00	0.60	0.00
23.79	89.02	2.00	0.00	0.60	0.00	23.95	87.74	2.00	0.00	0.59	0.00
24.11	84.77	2.00	0.00	0.59	0.00	24.28	84.58	2.00	0.00	0.59	0.00
24.44	90.92	2.00	0.00	0.59	0.00	24.61	100.11	2.00	0.00	0.58	0.00
24.77	107.83	2.00	0.00	0.58	0.00	24.93	112.16	2.00	0.00	0.58	0.00
25.10	113.16	2.00	0.00	0.57	0.00	25.26	109.84	2.00	0.00	0.57	0.00
25.43	102.52	2.00	0.00	0.57	0.00	25.59	93.21	2.00	0.00	0.57	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
25.76	87.31	2.00	0.00	0.56	0.00	25.92	87.20	2.00	0.00	0.56	0.00
26.08	90.12	2.00	0.00	0.56	0.00	26.25	91.15	2.00	0.00	0.56	0.00
26.41	90.84	2.00	0.00	0.55	0.00	26.58	89.69	2.00	0.00	0.55	0.00
26.74	92.99	2.00	0.00	0.55	0.00	26.90	97.20	2.00	0.00	0.54	0.00
27.07	101.82	2.00	0.00	0.54	0.00	27.23	104.59	2.00	0.00	0.54	0.00
27.40	108.67	2.00	0.00	0.54	0.00	27.56	110.90	2.00	0.00	0.53	0.00
27.72	110.85	2.00	0.00	0.53	0.00	27.89	106.50	2.00	0.00	0.53	0.00
28.05	101.80	2.00	0.00	0.52	0.00	28.22	99.44	2.00	0.00	0.52	0.00
28.38	98.74	2.00	0.00	0.52	0.00	28.54	96.43	2.00	0.00	0.52	0.00
28.71	92.66	2.00	0.00	0.51	0.00	28.87	90.24	2.00	0.00	0.51	0.00
29.04	95.22	2.00	0.00	0.51	0.00	29.20	98.88	2.00	0.00	0.51	0.00
29.36	103.91	2.00	0.00	0.50	0.00	29.53	104.58	2.00	0.00	0.50	0.00
29.69	103.82	2.00	0.00	0.50	0.00	29.86	98.43	2.00	0.00	0.49	0.00
30.02	92.31	2.00	0.00	0.49	0.00	30.18	89.22	2.00	0.00	0.49	0.00
30.35	89.59	2.00	0.00	0.49	0.00	30.51	89.62	2.00	0.00	0.48	0.00
30.68	87.18	2.00	0.00	0.48	0.00	30.84	82.17	2.00	0.00	0.48	0.00
31.00	80.53	2.00	0.00	0.47	0.00	31.17	81.19	2.00	0.00	0.47	0.00
31.33	84.94	2.00	0.00	0.47	0.00	31.50	87.92	2.00	0.00	0.47	0.00
31.66	89.51	2.00	0.00	0.46	0.00	31.82	88.32	2.00	0.00	0.46	0.00
31.99	86.66	2.00	0.00	0.46	0.00	32.15	90.09	2.00	0.00	0.46	0.00
32.32	96.70	2.00	0.00	0.45	0.00	32.48	99.94	2.00	0.00	0.45	0.00
32.64	97.70	2.00	0.00	0.45	0.00	32.81	93.79	2.00	0.00	0.44	0.00
32.97	89.24	2.00	0.00	0.44	0.00	33.14	86.78	2.00	0.00	0.44	0.00
33.30	83.00	2.00	0.00	0.44	0.00	33.47	79.62	2.00	0.00	0.43	0.00
33.63	75.40	2.00	0.00	0.43	0.00	33.79	71.55	2.00	0.00	0.43	0.00
33.96	69.05	2.00	0.00	0.42	0.00	34.12	67.76	2.00	0.00	0.42	0.00
34.28	68.24	2.00	0.00	0.42	0.00	34.45	70.65	2.00	0.00	0.42	0.00
34.61	73.83	2.00	0.00	0.41	0.00	34.78	76.15	2.00	0.00	0.41	0.00
34.94	78.52	2.00	0.00	0.41	0.00	35.11	80.82	2.00	0.00	0.41	0.00
35.27	82.00	2.00	0.00	0.40	0.00	35.43	80.94	2.00	0.00	0.40	0.00
35.60	79.07	2.00	0.00	0.40	0.00	35.76	79.23	2.00	0.00	0.39	0.00
35.93	83.09	2.00	0.00	0.39	0.00	36.09	89.81	2.00	0.00	0.39	0.00
36.25	96.51	2.00	0.00	0.39	0.00	36.42	101.45	2.00	0.00	0.38	0.00
36.58	102.63	2.00	0.00	0.38	0.00	36.75	101.41	2.00	0.00	0.38	0.00
36.91	99.35	2.00	0.00	0.37	0.00	37.07	98.80	2.00	0.00	0.37	0.00
37.24	101.41	2.00	0.00	0.37	0.00	37.40	106.00	2.00	0.00	0.37	0.00
37.57	111.67	2.00	0.00	0.36	0.00	37.73	114.52	2.00	0.00	0.36	0.00
37.89	116.58	2.00	0.00	0.36	0.00	38.06	114.90	2.00	0.00	0.35	0.00
38.22	113.06	2.00	0.00	0.35	0.00	38.39	108.26	2.00	0.00	0.35	0.00
38.55	105.67	2.00	0.00	0.35	0.00	38.71	101.58	2.00	0.00	0.34	0.00
38.88	99.49	2.00	0.00	0.34	0.00	39.04	96.87	2.00	0.00	0.34	0.00
39.21	95.15	2.00	0.00	0.34	0.00	39.37	92.05	2.00	0.00	0.33	0.00
39.53	87.61	2.00	0.00	0.33	0.00	39.70	84.69	2.00	0.00	0.33	0.00
39.86	81.47	2.00	0.00	0.32	0.00	40.03	78.22	2.00	0.00	0.32	0.00
40.19	72.23	2.00	0.00	0.32	0.00	40.35	66.89	2.00	0.00	0.32	0.00
40.52	62.19	2.00	0.00	0.31	0.00	40.68	60.60	2.00	0.00	0.31	0.00
40.85	60.65	2.00	0.00	0.31	0.00	41.01	68.31	2.00	0.00	0.30	0.00
41.18	83.32	2.00	0.00	0.30	0.00	41.34	111.18	2.00	0.00	0.30	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
41.50	130.97	0.60	0.56	0.30	0.01	41.67	142.86	0.72	0.44	0.29	0.01
41.83	134.13	0.63	0.53	0.29	0.01	42.00	119.84	2.00	0.00	0.29	0.00
42.16	100.01	2.00	0.00	0.29	0.00	42.32	89.78	2.00	0.00	0.28	0.00
42.49	82.25	2.00	0.00	0.28	0.00	42.65	79.01	2.00	0.00	0.28	0.00
42.82	75.92	2.00	0.00	0.27	0.00	42.98	74.79	2.00	0.00	0.27	0.00
43.14	76.02	2.00	0.00	0.27	0.00	43.31	78.44	2.00	0.00	0.27	0.00
43.47	80.82	2.00	0.00	0.26	0.00	43.64	83.19	2.00	0.00	0.26	0.00
43.80	85.06	2.00	0.00	0.26	0.00	43.96	85.92	2.00	0.00	0.25	0.00
44.13	85.52	2.00	0.00	0.25	0.00	44.29	84.46	2.00	0.00	0.25	0.00
44.46	82.96	2.00	0.00	0.25	0.00	44.62	81.59	2.00	0.00	0.24	0.00
44.78	80.42	2.00	0.00	0.24	0.00	44.95	79.63	2.00	0.00	0.24	0.00
45.11	79.97	2.00	0.00	0.24	0.00	45.28	79.38	2.00	0.00	0.23	0.00
45.44	77.88	2.00	0.00	0.23	0.00	45.60	73.04	2.00	0.00	0.23	0.00
45.77	68.02	2.00	0.00	0.22	0.00	45.93	63.70	2.00	0.00	0.22	0.00
46.10	62.22	2.00	0.00	0.22	0.00	46.26	63.95	2.00	0.00	0.22	0.00
46.42	67.06	2.00	0.00	0.21	0.00	46.59	71.47	2.00	0.00	0.21	0.00
46.75	72.82	2.00	0.00	0.21	0.00	46.92	75.42	2.00	0.00	0.20	0.00
47.08	78.11	2.00	0.00	0.20	0.00	47.24	82.36	2.00	0.00	0.20	0.00
47.41	82.77	2.00	0.00	0.20	0.00	47.57	79.73	2.00	0.00	0.19	0.00
47.74	74.41	2.00	0.00	0.19	0.00	47.90	70.99	2.00	0.00	0.19	0.00
48.06	70.36	2.00	0.00	0.19	0.00	48.23	69.83	2.00	0.00	0.18	0.00
48.39	67.91	2.00	0.00	0.18	0.00	48.56	63.81	2.00	0.00	0.18	0.00
48.72	61.67	2.00	0.00	0.17	0.00	48.89	60.64	2.00	0.00	0.17	0.00
49.05	62.66	2.00	0.00	0.17	0.00	49.21	65.08	2.00	0.00	0.17	0.00
49.38	68.13	2.00	0.00	0.16	0.00	49.54	70.91	2.00	0.00	0.16	0.00
49.71	73.65	2.00	0.00	0.16	0.00	49.87	63.71	2.00	0.00	0.15	0.00
50.03	49.61	2.00	0.00	0.15	0.00	50.20	-1.00	2.00	0.00	0.15	0.00

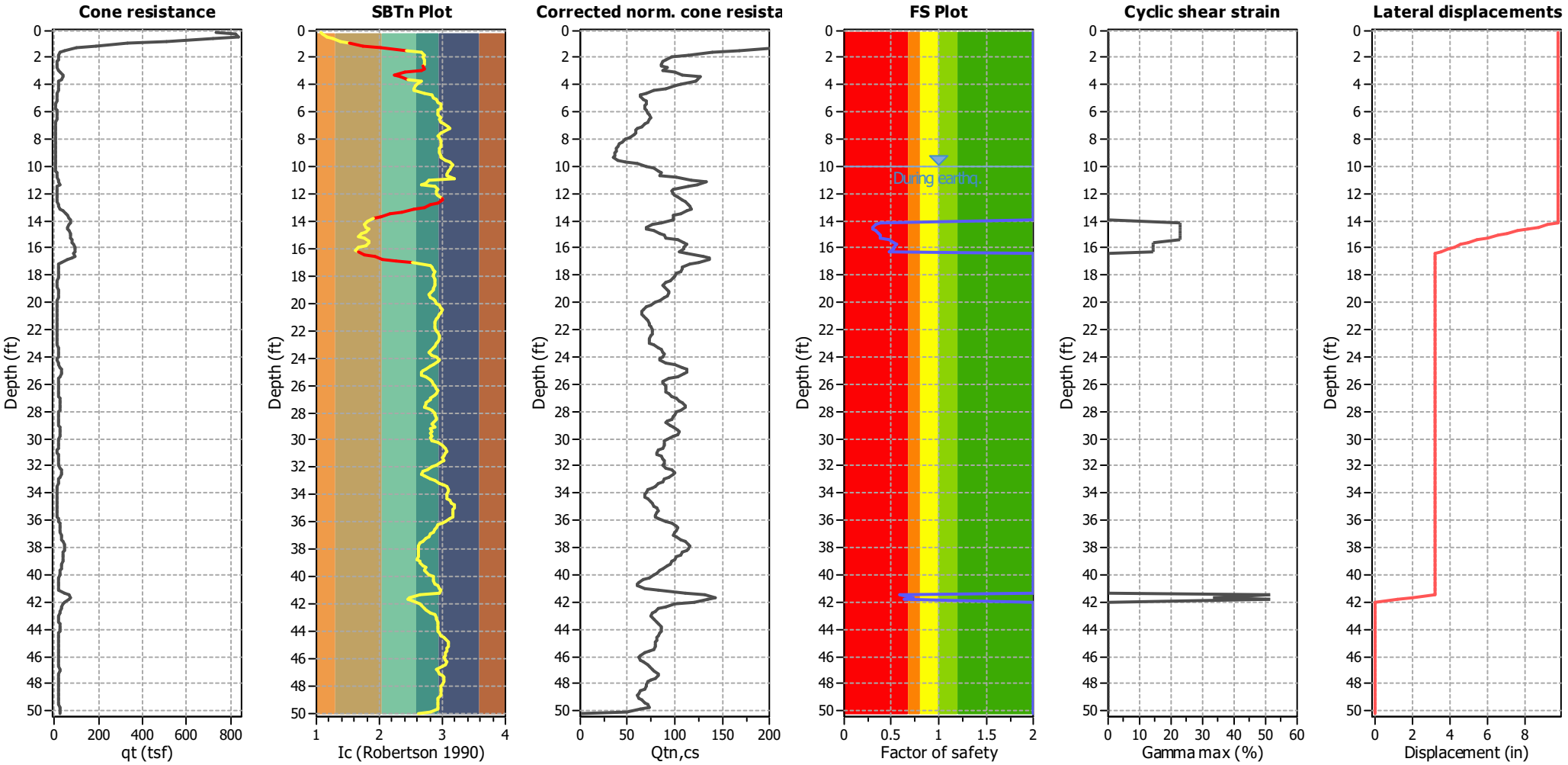
Total estimated settlement: 0.55

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Estimation of post-earthquake lateral Displacements

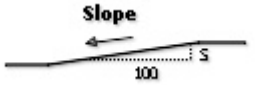
Geometric parameters: Gently sloping ground without free face (Slope 1.00 %)



Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$Q_{tn,cs}$: Equivalent clean sand normalized CPT total cone resistance
F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

Surface condition



:: Lateral displacement index calculation ::

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
10.01	5.63	8.18	3.52	70.47	2.00	0.00	0.00	0.00
10.17	6.46	9.50	3.91	78.24	2.00	0.00	0.00	0.00
10.34	7.18	10.65	3.98	82.69	2.00	0.00	0.00	0.00
10.50	7.57	11.25	4.09	85.63	2.00	0.00	0.00	0.00
10.66	7.52	11.17	4.01	84.75	2.00	0.00	0.00	0.00
10.83	7.36	10.90	6.22	100.92	2.00	0.00	0.00	0.00
10.99	16.27	25.19	3.98	117.48	2.00	21.50	0.00	0.00
11.16	19.75	30.77	4.31	133.04	2.00	28.10	0.00	0.00
11.32	21.17	33.03	3.55	123.43	2.00	30.44	0.00	0.00
11.48	13.24	20.28	4.42	113.53	2.00	14.34	0.00	0.00
11.65	10.95	16.58	3.89	98.51	2.00	7.69	0.00	0.00
11.81	10.97	16.59	3.76	96.94	2.00	7.72	0.00	0.00
11.98	11.30	17.11	3.80	98.70	2.00	8.72	0.00	0.00
12.14	11.03	16.67	4.04	100.57	2.00	7.86	0.00	0.00
12.30	10.30	15.48	4.58	103.44	2.00	5.41	0.00	0.00
12.47	10.59	15.93	4.83	107.34	2.00	6.37	0.00	0.00
12.63	12.13	18.39	4.63	111.80	2.00	11.11	0.00	0.00
12.80	15.19	23.19	4.03	114.84	2.00	18.77	0.00	0.00
12.96	18.96	28.40	3.56	116.59	2.00	25.45	0.00	0.00
13.12	26.93	39.12	2.87	117.90	2.00	36.02	0.00	0.00
13.29	37.66	52.67	2.09	112.76	2.00	45.84	0.00	0.00
13.45	48.57	65.44	1.44	105.68	2.00	53.00	0.00	0.00
13.62	57.60	74.89	0.93	98.57	2.00	57.45	0.00	0.00
13.78	65.10	82.50	0.68	97.93	2.00	60.65	0.00	0.00
13.94	70.82	88.04	0.53	98.40	2.00	62.80	0.00	0.00
14.11	69.64	85.61	0.42	85.61	0.38	61.87	22.70	0.54
14.27	62.77	76.68	0.32	76.68	0.33	58.23	22.70	0.54
14.44	57.04	69.74	0.31	69.74	0.30	55.11	22.70	0.54
14.60	57.39	70.42	0.38	70.42	0.30	55.43	22.70	0.54
14.76	64.30	77.98	0.36	77.98	0.33	58.79	22.70	0.54
14.93	70.18	84.07	0.31	84.07	0.36	61.27	22.70	0.54
15.09	74.76	88.39	0.25	88.39	0.38	62.93	22.70	0.54
15.26	75.18	90.06	0.42	90.06	0.39	63.54	22.70	0.54
15.42	75.76	91.58	0.59	103.34	0.48	64.10	22.70	0.54
15.58	79.80	96.41	0.68	110.02	0.53	65.79	14.50	0.34
15.75	86.62	103.12	0.57	112.32	0.55	68.02	14.50	0.34
15.91	94.08	109.82	0.40	109.82	0.52	70.09	14.50	0.34
16.08	94.39	109.61	0.32	109.61	0.52	70.03	14.50	0.34
16.24	90.80	105.22	0.37	105.22	0.48	68.68	14.50	0.34
16.40	88.00	103.32	0.57	112.40	2.00	68.08	0.00	0.00
16.57	89.72	107.45	1.05	130.23	2.00	69.37	0.00	0.00
16.73	81.84	99.46	1.51	136.95	2.00	66.82	0.00	0.00
16.90	59.51	74.01	2.22	136.21	2.00	57.07	0.00	0.00
17.06	33.50	42.61	2.99	124.74	2.00	38.84	0.00	0.00
17.22	18.83	24.22	3.94	115.91	2.00	20.20	0.00	0.00
17.39	16.62	21.19	3.75	107.32	2.00	15.79	0.00	0.00
17.55	16.13	20.46	3.86	107.36	2.00	14.64	0.00	0.00
17.72	15.52	19.58	3.89	105.95	2.00	13.18	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
17.88	15.24	19.07	3.69	102.22	2.00	12.30	0.00	0.00
18.05	14.94	18.56	3.55	99.25	2.00	11.41	0.00	0.00
18.21	14.54	17.94	3.52	97.71	2.00	10.30	0.00	0.00
18.37	13.86	16.96	3.43	94.45	2.00	8.44	0.00	0.00
18.54	13.36	16.21	3.23	90.33	2.00	6.94	0.00	0.00
18.70	13.29	16.00	3.06	87.63	2.00	6.52	0.00	0.00
18.87	13.88	16.64	3.02	88.36	2.00	7.81	0.00	0.00
19.03	14.82	17.73	3.12	91.90	2.00	9.90	0.00	0.00
19.19	16.33	19.46	3.00	93.38	2.00	12.98	0.00	0.00
19.36	16.64	19.74	3.01	93.94	2.00	13.44	0.00	0.00
19.52	15.87	18.70	2.99	91.92	2.00	11.66	0.00	0.00
19.69	14.20	16.59	3.05	88.75	2.00	7.72	0.00	0.00
19.85	13.00	15.04	2.97	84.62	2.00	4.46	0.00	0.00
20.01	11.95	13.67	2.83	80.00	2.00	1.31	0.00	0.00
20.18	10.81	12.21	2.67	74.95	2.00	0.00	0.00	0.00
20.34	9.63	10.70	2.55	70.14	2.00	0.00	0.00	0.00
20.51	9.03	9.89	2.36	66.10	2.00	0.00	0.00	0.00
20.67	9.08	9.89	2.24	64.78	2.00	0.00	0.00	0.00
20.83	9.66	10.54	2.16	65.22	2.00	0.00	0.00	0.00
21.00	10.30	11.25	2.20	67.22	2.00	0.00	0.00	0.00
21.16	11.08	12.11	2.25	69.60	2.00	0.00	0.00	0.00
21.33	11.67	12.75	2.30	71.48	2.00	0.00	0.00	0.00
21.49	12.07	13.16	2.30	72.28	2.00	0.05	0.00	0.00
21.65	12.09	13.12	2.34	72.79	2.00	0.00	0.00	0.00
21.82	12.26	13.27	2.42	74.02	2.00	0.33	0.00	0.00
21.98	12.37	13.34	2.51	75.42	2.00	0.50	0.00	0.00
22.15	12.13	13.01	2.64	76.44	2.00	0.00	0.00	0.00
22.31	11.63	12.38	2.70	75.87	2.00	0.00	0.00	0.00
22.47	11.17	11.78	2.69	74.33	2.00	0.00	0.00	0.00
22.64	11.15	11.69	2.59	72.98	2.00	0.00	0.00	0.00
22.80	11.42	11.93	2.48	72.23	2.00	0.00	0.00	0.00
22.97	12.27	12.83	2.44	73.52	2.00	0.00	0.00	0.00
23.13	13.30	13.94	2.58	77.52	2.00	1.96	0.00	0.00
23.29	15.00	15.79	2.70	82.66	2.00	6.07	0.00	0.00
23.46	16.81	17.72	2.69	86.03	2.00	9.88	0.00	0.00
23.62	17.64	18.56	2.73	87.99	2.00	11.41	0.00	0.00
23.79	16.70	17.45	2.93	89.02	2.00	9.38	0.00	0.00
23.95	14.59	15.07	3.19	87.74	2.00	4.53	0.00	0.00
24.11	13.17	13.43	3.25	84.77	2.00	0.74	0.00	0.00
24.28	13.66	13.89	3.14	84.58	2.00	1.85	0.00	0.00
24.44	16.51	16.94	3.14	90.92	2.00	8.40	0.00	0.00
24.61	19.84	20.48	3.31	100.11	2.00	14.66	0.00	0.00
24.77	24.04	24.90	3.32	107.83	2.00	21.11	0.00	0.00
24.93	28.07	29.07	3.20	112.16	2.00	26.22	0.00	0.00
25.10	29.68	30.62	3.14	113.16	2.00	27.94	0.00	0.00
25.26	28.08	28.79	3.10	109.84	2.00	25.90	0.00	0.00
25.43	23.23	23.54	3.13	102.52	2.00	19.26	0.00	0.00
25.59	19.44	19.41	2.97	93.21	2.00	12.90	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
25.76	17.14	16.90	2.88	87.31	2.00	8.32	0.00	0.00
25.92	16.53	16.18	2.97	87.20	2.00	6.89	0.00	0.00
26.08	16.48	16.07	3.20	90.12	2.00	6.66	0.00	0.00
26.25	16.05	15.55	3.37	91.15	2.00	5.57	0.00	0.00
26.41	15.78	15.20	3.41	90.84	2.00	4.82	0.00	0.00
26.58	16.43	15.79	3.21	89.69	2.00	6.08	0.00	0.00
26.74	17.80	17.14	3.25	92.99	2.00	8.78	0.00	0.00
26.90	20.61	19.94	3.18	97.20	2.00	13.78	0.00	0.00
27.07	22.02	21.30	3.32	101.82	2.00	15.96	0.00	0.00
27.23	24.98	24.20	3.19	104.59	2.00	20.17	0.00	0.00
27.40	26.11	25.25	3.33	108.67	2.00	21.57	0.00	0.00
27.56	27.59	26.62	3.33	110.90	2.00	23.32	0.00	0.00
27.72	24.73	23.65	3.64	110.85	2.00	19.41	0.00	0.00
27.89	22.20	21.00	3.68	106.50	2.00	15.48	0.00	0.00
28.05	19.91	18.61	3.68	101.80	2.00	11.50	0.00	0.00
28.22	19.53	18.13	3.58	99.44	2.00	10.65	0.00	0.00
28.38	18.59	17.11	3.69	98.74	2.00	8.73	0.00	0.00
28.54	18.53	16.97	3.54	96.43	2.00	8.46	0.00	0.00
28.71	18.91	17.26	3.20	92.66	2.00	9.02	0.00	0.00
28.87	19.48	17.74	2.96	90.24	2.00	9.92	0.00	0.00
29.04	19.42	17.61	3.34	95.22	2.00	9.68	0.00	0.00
29.20	22.14	20.19	3.25	98.88	2.00	14.19	0.00	0.00
29.36	22.46	20.42	3.57	103.91	2.00	14.56	0.00	0.00
29.53	23.78	21.60	3.46	104.58	2.00	16.42	0.00	0.00
29.69	23.03	20.78	3.51	103.82	2.00	15.15	0.00	0.00
29.86	22.49	20.16	3.22	98.43	2.00	14.15	0.00	0.00
30.02	20.18	17.86	3.09	92.31	2.00	10.14	0.00	0.00
30.18	17.12	14.85	3.33	89.22	2.00	4.06	0.00	0.00
30.35	15.81	13.53	3.63	89.59	2.00	0.97	0.00	0.00
30.51	15.20	12.88	3.79	89.62	2.00	0.00	0.00	0.00
30.68	14.12	11.80	3.86	87.18	2.00	0.00	0.00	0.00
30.84	13.33	11.00	3.58	82.17	2.00	0.00	0.00	0.00
31.00	13.59	11.19	3.36	80.53	2.00	0.00	0.00	0.00
31.17	14.12	11.65	3.30	81.19	2.00	0.00	0.00	0.00
31.33	15.08	12.49	3.45	84.94	2.00	0.00	0.00	0.00
31.50	15.32	12.65	3.69	87.92	2.00	0.00	0.00	0.00
31.66	16.56	13.75	3.57	89.51	2.00	1.51	0.00	0.00
31.82	18.38	15.38	3.16	88.32	2.00	5.21	0.00	0.00
31.99	19.93	16.75	2.83	86.66	2.00	8.02	0.00	0.00
32.15	23.58	20.05	2.69	90.09	2.00	13.96	0.00	0.00
32.32	28.50	24.50	2.69	96.70	2.00	20.58	0.00	0.00
32.48	30.57	26.30	2.73	99.94	2.00	22.91	0.00	0.00
32.64	28.23	24.06	2.78	97.70	2.00	19.97	0.00	0.00
32.81	23.18	19.34	3.00	93.79	2.00	12.77	0.00	0.00
32.97	19.81	16.21	3.09	89.24	2.00	6.94	0.00	0.00
33.14	17.47	14.01	3.27	86.78	2.00	2.14	0.00	0.00
33.30	15.34	12.05	3.36	83.00	2.00	0.00	0.00	0.00
33.47	13.75	10.58	3.43	79.62	2.00	0.00	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
33.63	12.58	9.50	3.32	75.40	2.00	0.00	0.00	0.00
33.79	12.19	9.12	3.03	71.55	2.00	0.00	0.00	0.00
33.96	12.16	9.05	2.79	69.05	2.00	0.00	0.00	0.00
34.12	12.21	9.06	2.66	67.76	2.00	0.00	0.00	0.00
34.28	12.15	8.97	2.73	68.24	2.00	0.00	0.00	0.00
34.45	12.01	8.81	3.03	70.65	2.00	0.00	0.00	0.00
34.61	11.80	8.58	3.48	73.83	2.00	0.00	0.00	0.00
34.78	11.66	8.43	3.83	76.15	2.00	0.00	0.00	0.00
34.94	12.10	8.77	3.97	78.52	2.00	0.00	0.00	0.00
35.11	12.77	9.31	4.02	80.82	2.00	0.00	0.00	0.00
35.27	12.93	9.41	4.12	82.00	2.00	0.00	0.00	0.00
35.43	12.69	9.16	4.10	80.94	2.00	0.00	0.00	0.00
35.60	12.53	8.98	3.94	79.07	2.00	0.00	0.00	0.00
35.76	13.35	9.65	3.69	79.23	2.00	0.00	0.00	0.00
35.93	15.45	11.38	3.54	83.09	2.00	0.00	0.00	0.00
36.09	18.11	13.57	3.62	89.81	2.00	1.08	0.00	0.00
36.25	20.88	15.86	3.72	96.51	2.00	6.23	0.00	0.00
36.42	22.88	17.50	3.82	101.45	2.00	9.46	0.00	0.00
36.58	24.09	18.45	3.75	102.63	2.00	11.22	0.00	0.00
36.75	24.99	19.16	3.55	101.41	2.00	12.45	0.00	0.00
36.91	26.08	20.02	3.29	99.35	2.00	13.91	0.00	0.00
37.07	27.78	21.40	3.09	98.80	2.00	16.11	0.00	0.00
37.24	29.98	23.18	3.07	101.41	2.00	18.75	0.00	0.00
37.40	33.96	26.46	3.05	106.00	2.00	23.12	0.00	0.00
37.57	38.81	30.45	3.05	111.67	2.00	27.76	0.00	0.00
37.73	41.93	32.98	3.02	114.52	2.00	30.39	0.00	0.00
37.89	43.07	33.80	3.07	116.58	2.00	31.20	0.00	0.00
38.06	42.24	32.99	3.04	114.90	2.00	30.39	0.00	0.00
38.22	41.54	32.29	2.99	113.06	2.00	29.69	0.00	0.00
38.39	41.31	32.03	2.77	108.26	2.00	29.42	0.00	0.00
38.55	40.24	31.03	2.70	105.67	2.00	28.38	0.00	0.00
38.71	39.45	30.31	2.55	101.58	2.00	27.60	0.00	0.00
38.88	37.05	28.21	2.57	99.49	2.00	25.23	0.00	0.00
39.04	35.01	26.42	2.55	96.87	2.00	23.07	0.00	0.00
39.21	32.19	24.00	2.63	95.15	2.00	19.89	0.00	0.00
39.37	29.71	21.89	2.63	92.05	2.00	16.85	0.00	0.00
39.53	28.89	21.18	2.43	87.61	2.00	15.77	0.00	0.00
39.70	26.85	19.45	2.40	84.69	2.00	12.96	0.00	0.00
39.86	24.35	17.36	2.40	81.47	2.00	9.20	0.00	0.00
40.03	21.26	14.81	2.47	78.22	2.00	3.95	0.00	0.00
40.19	20.00	13.79	2.17	72.23	2.00	1.60	0.00	0.00
40.35	18.63	12.67	1.93	66.89	2.00	0.00	0.00	0.00
40.52	16.69	11.11	1.79	62.19	2.00	0.00	0.00	0.00
40.68	15.28	9.95	1.83	60.60	2.00	0.00	0.00	0.00
40.85	15.10	9.76	1.86	60.65	2.00	0.00	0.00	0.00
41.01	16.04	10.42	2.38	68.31	2.00	0.00	0.00	0.00
41.18	19.93	13.34	3.09	83.32	2.00	0.52	0.00	0.00
41.34	42.82	31.40	2.95	111.18	2.00	28.77	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
41.50	65.29	49.32	2.89	130.97	0.60	43.67	51.20	1.21
41.67	75.04	56.92	3.04	142.86	0.72	48.40	33.35	0.79
41.83	63.28	47.28	3.12	134.13	0.63	42.27	51.20	1.21
42.00	45.74	33.15	3.28	119.84	2.00	30.55	0.00	0.00
42.16	37.99	27.11	2.67	100.01	2.00	23.92	0.00	0.00
42.32	31.93	22.33	2.46	89.78	2.00	17.51	0.00	0.00
42.49	28.16	19.36	2.26	82.25	2.00	12.81	0.00	0.00
42.65	24.03	16.08	2.37	79.01	2.00	6.67	0.00	0.00
42.82	20.94	13.64	2.45	75.92	2.00	1.24	0.00	0.00
42.98	20.43	13.21	2.43	74.79	2.00	0.18	0.00	0.00
43.14	20.44	13.16	2.53	76.02	2.00	0.06	0.00	0.00
43.31	20.19	12.89	2.77	78.44	2.00	0.00	0.00	0.00
43.47	20.79	13.27	2.89	80.82	2.00	0.35	0.00	0.00
43.64	21.56	13.79	2.99	83.19	2.00	1.61	0.00	0.00
43.80	22.32	14.30	3.06	85.06	2.00	2.80	0.00	0.00
43.96	22.39	14.30	3.13	85.92	2.00	2.80	0.00	0.00
44.13	21.71	13.72	3.20	85.52	2.00	1.45	0.00	0.00
44.29	20.49	12.78	3.30	84.46	2.00	0.00	0.00	0.00
44.46	19.29	11.89	3.37	82.96	2.00	0.00	0.00	0.00
44.62	18.16	11.05	3.46	81.59	2.00	0.00	0.00	0.00
44.78	17.31	10.41	3.53	80.42	2.00	0.00	0.00	0.00
44.95	16.91	10.09	3.55	79.63	2.00	0.00	0.00	0.00
45.11	17.00	10.12	3.58	79.97	2.00	0.00	0.00	0.00
45.28	17.47	10.41	3.42	79.38	2.00	0.00	0.00	0.00
45.44	17.54	10.43	3.26	77.88	2.00	0.00	0.00	0.00
45.60	17.16	10.13	2.87	73.04	2.00	0.00	0.00	0.00
45.77	16.26	9.47	2.55	68.02	2.00	0.00	0.00	0.00
45.93	15.53	8.93	2.27	63.70	2.00	0.00	0.00	0.00
46.10	15.20	8.68	2.19	62.22	2.00	0.00	0.00	0.00
46.26	15.10	8.58	2.38	63.95	2.00	0.00	0.00	0.00
46.42	16.17	9.28	2.50	67.06	2.00	0.00	0.00	0.00
46.59	18.27	10.68	2.59	71.47	2.00	0.00	0.00	0.00
46.75	20.78	12.44	2.39	72.82	2.00	0.00	0.00	0.00
46.92	21.44	12.85	2.53	75.42	2.00	0.00	0.00	0.00
47.08	21.27	12.64	2.78	78.11	2.00	0.00	0.00	0.00
47.24	20.53	12.06	3.27	82.36	2.00	0.00	0.00	0.00
47.41	20.40	11.93	3.34	82.77	2.00	0.00	0.00	0.00
47.57	19.58	11.34	3.20	79.73	2.00	0.00	0.00	0.00
47.74	18.70	10.72	2.85	74.41	2.00	0.00	0.00	0.00
47.90	18.35	10.45	2.60	70.99	2.00	0.00	0.00	0.00
48.06	19.06	10.89	2.45	70.36	2.00	0.00	0.00	0.00
48.23	19.05	10.85	2.42	69.83	2.00	0.00	0.00	0.00
48.39	18.34	10.34	2.35	67.91	2.00	0.00	0.00	0.00
48.56	17.38	9.68	2.12	63.81	2.00	0.00	0.00	0.00
48.72	17.37	9.64	1.95	61.67	2.00	0.00	0.00	0.00
48.89	18.04	10.11	1.80	60.64	2.00	0.00	0.00	0.00
49.05	18.47	10.35	1.92	62.66	2.00	0.00	0.00	0.00
49.21	19.33	10.89	2.02	65.08	2.00	0.00	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
49.38	20.05	11.32	2.19	68.13	2.00	0.00	0.00	0.00
49.54	20.80	11.78	2.34	70.91	2.00	0.00	0.00	0.00
49.71	21.68	12.32	2.47	73.65	2.00	0.00	0.00	0.00
49.87	22.82	13.26	1.65	63.71	2.00	0.32	0.00	0.00
50.03	23.87	14.29	0.82	49.61	2.00	2.79	0.00	0.00

GeoLogismiki
Geotechnical Engineers
Merarhias 56
http://www.geologismiki.gr

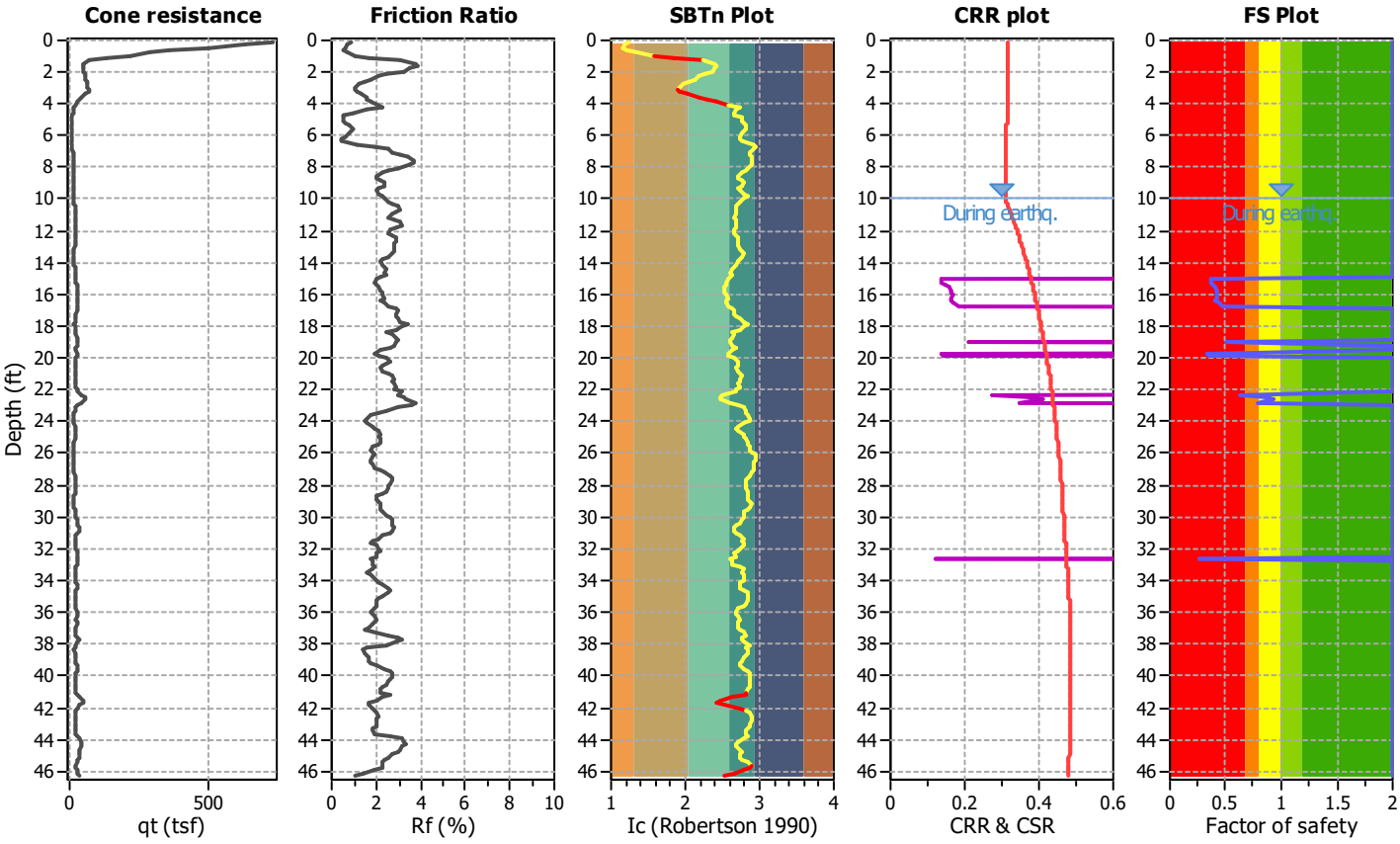
LIQUEFACTION ANALYSIS REPORT

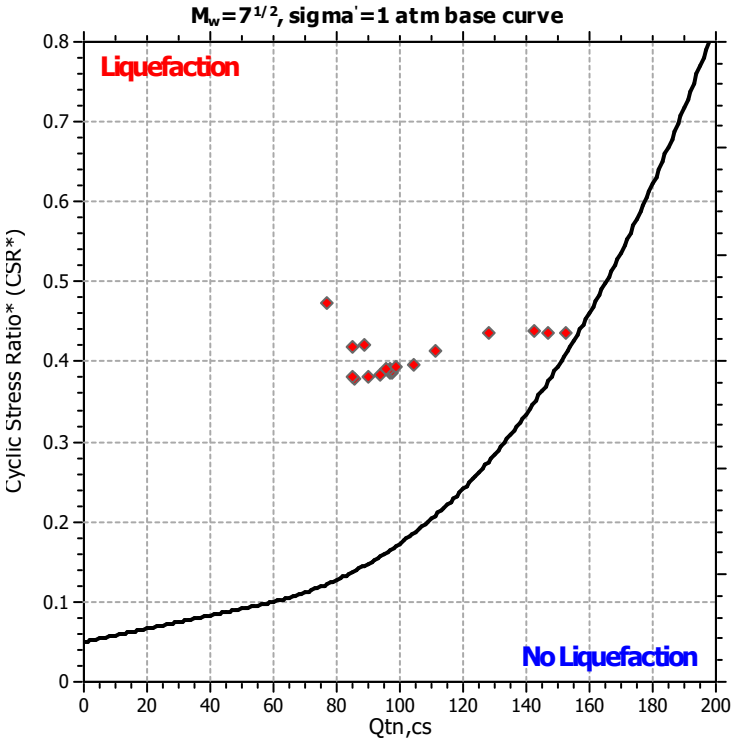
Project title : **Location :**

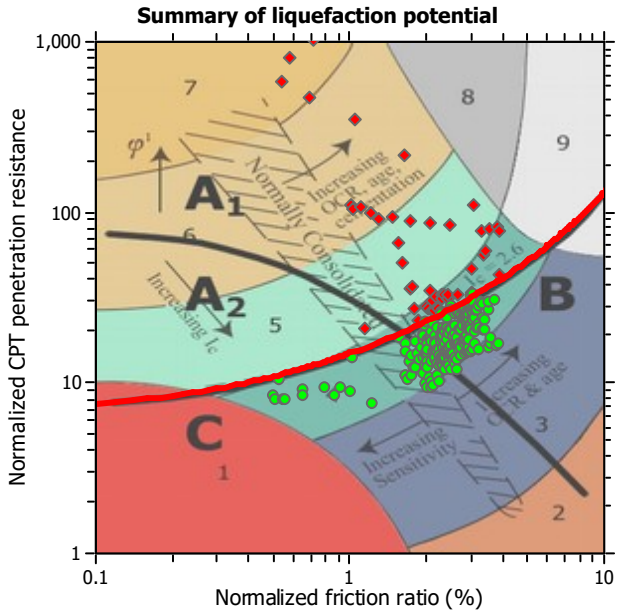
CPT file : CPT 3

Input parameters and analysis data

Analysis method:	NCEER (1998)	G.W.T. (in-situ):	10.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.10	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.56	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		

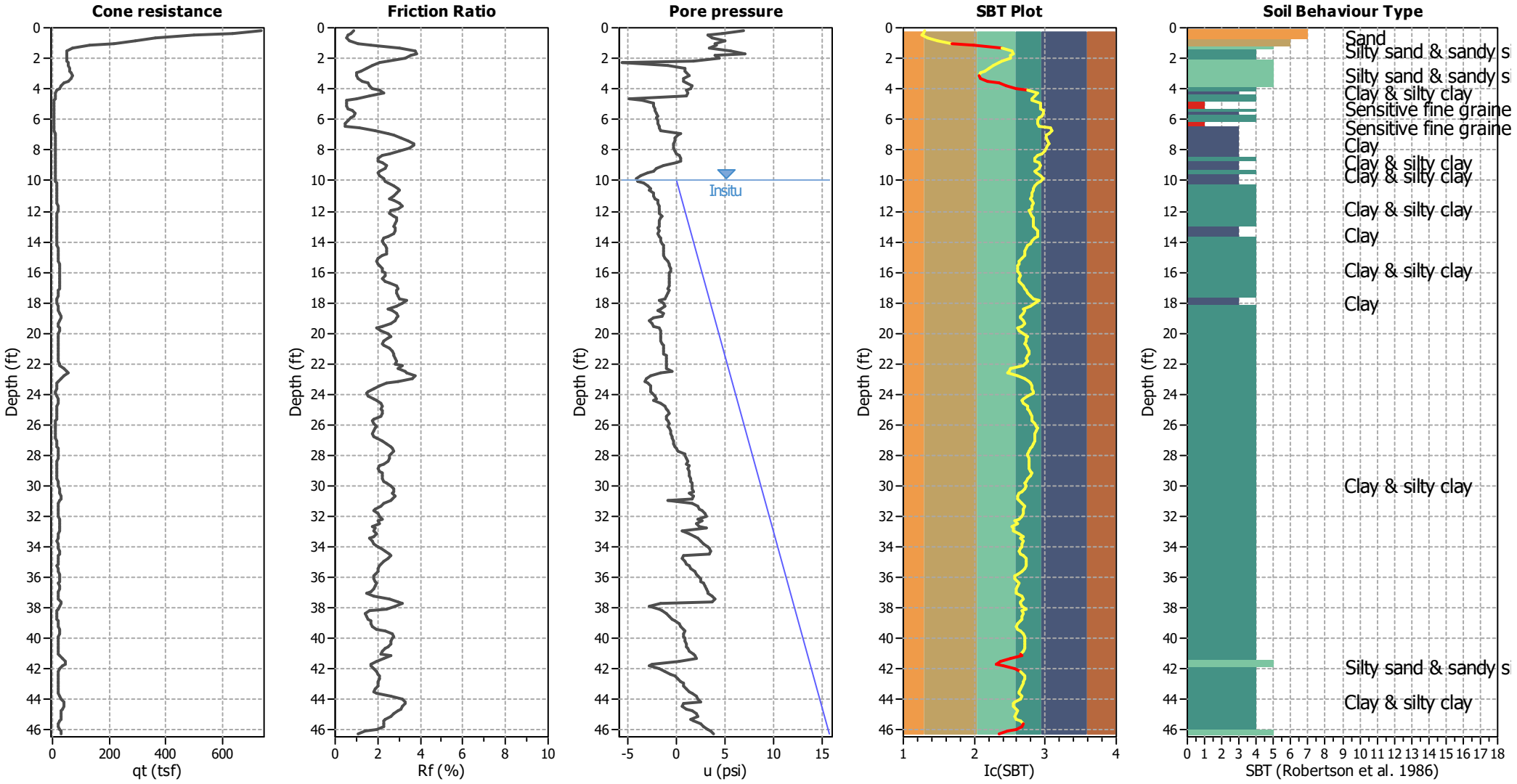






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots



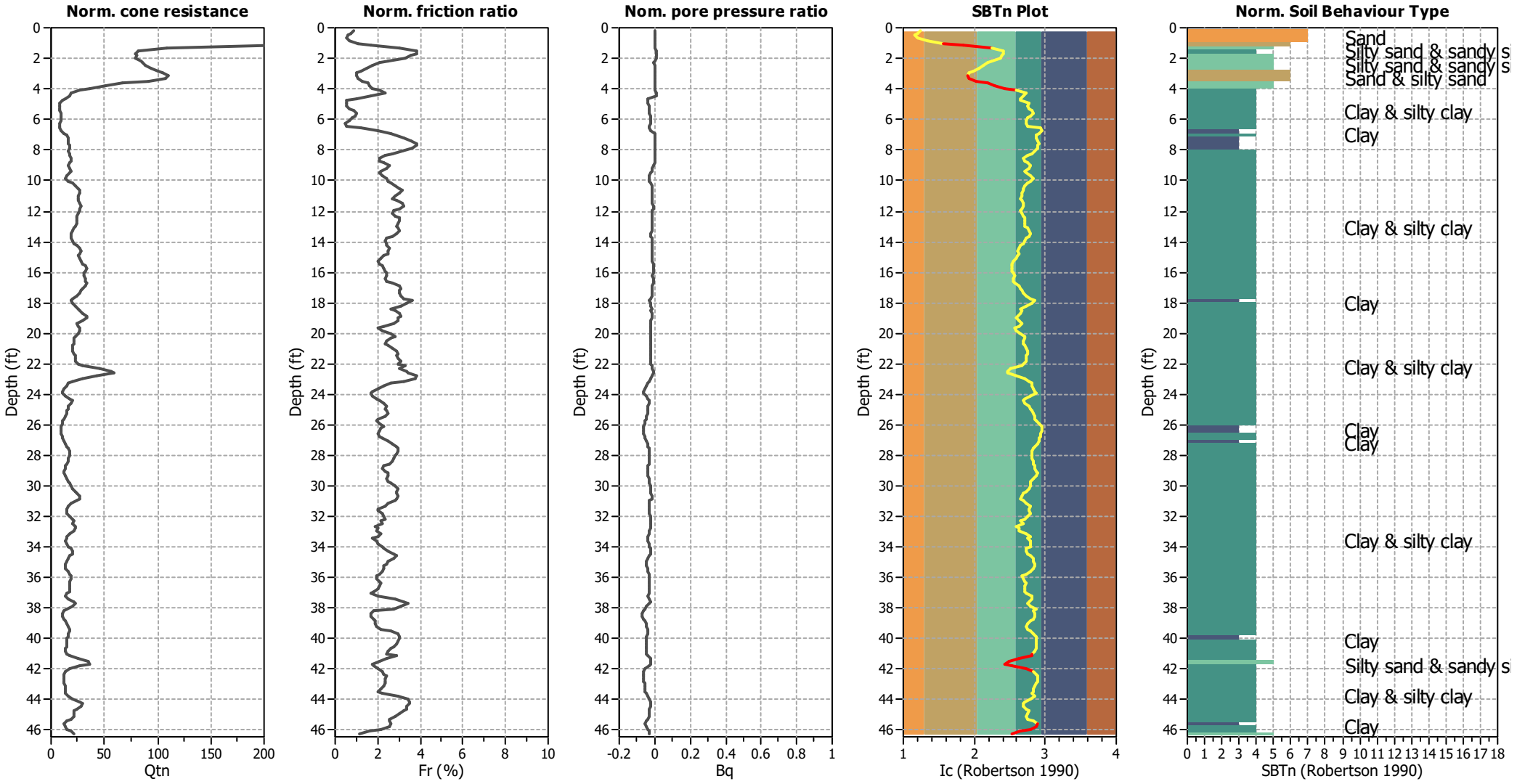
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normalized)



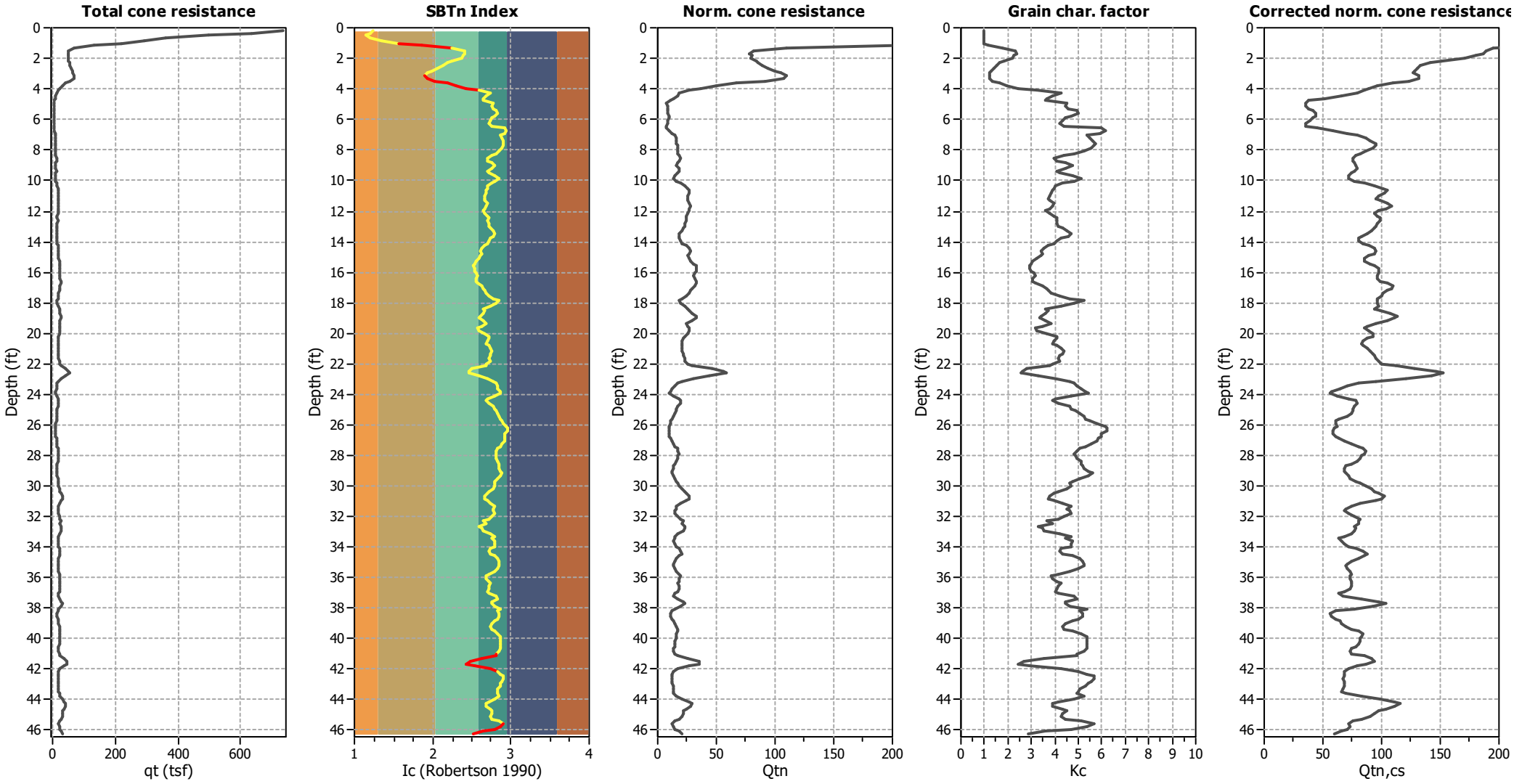
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

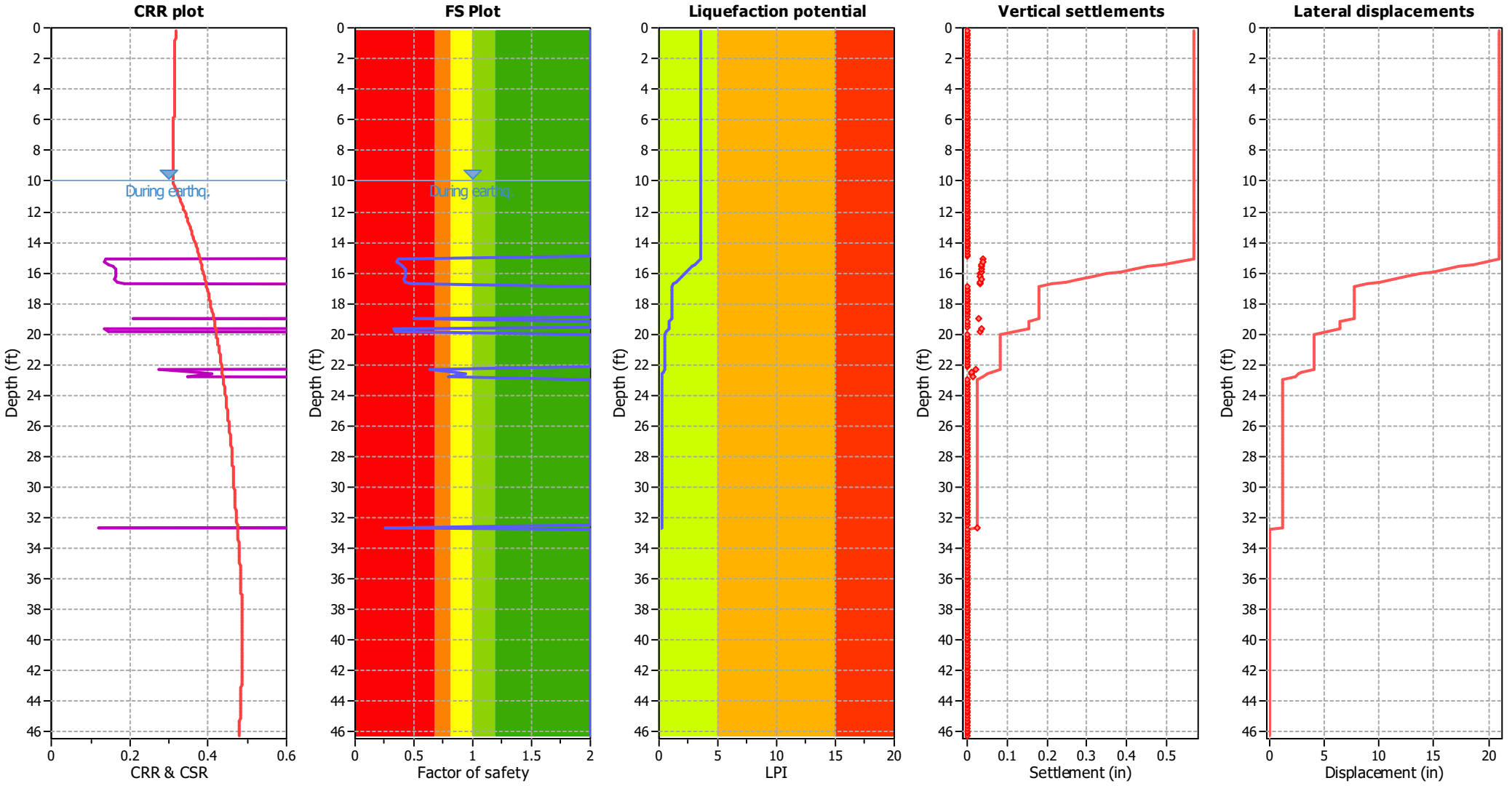
Liquefaction analysis overall plots (intermediate results)



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plots



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

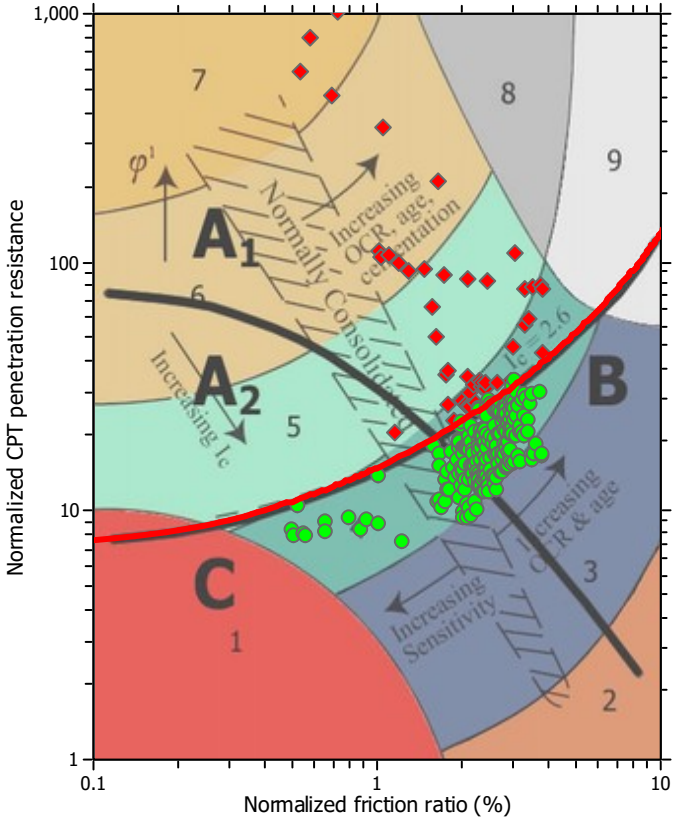
F.S. color scheme

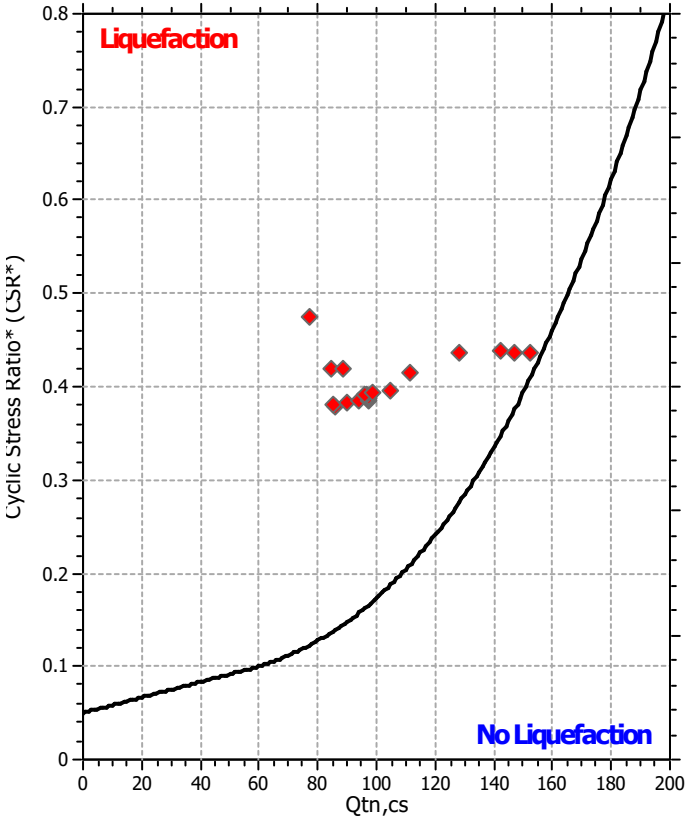
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

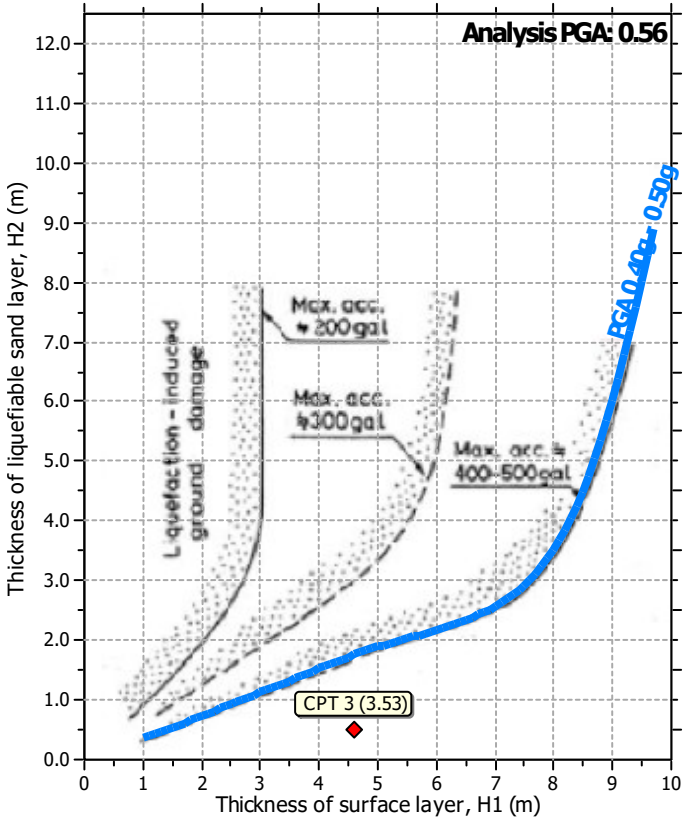
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plots



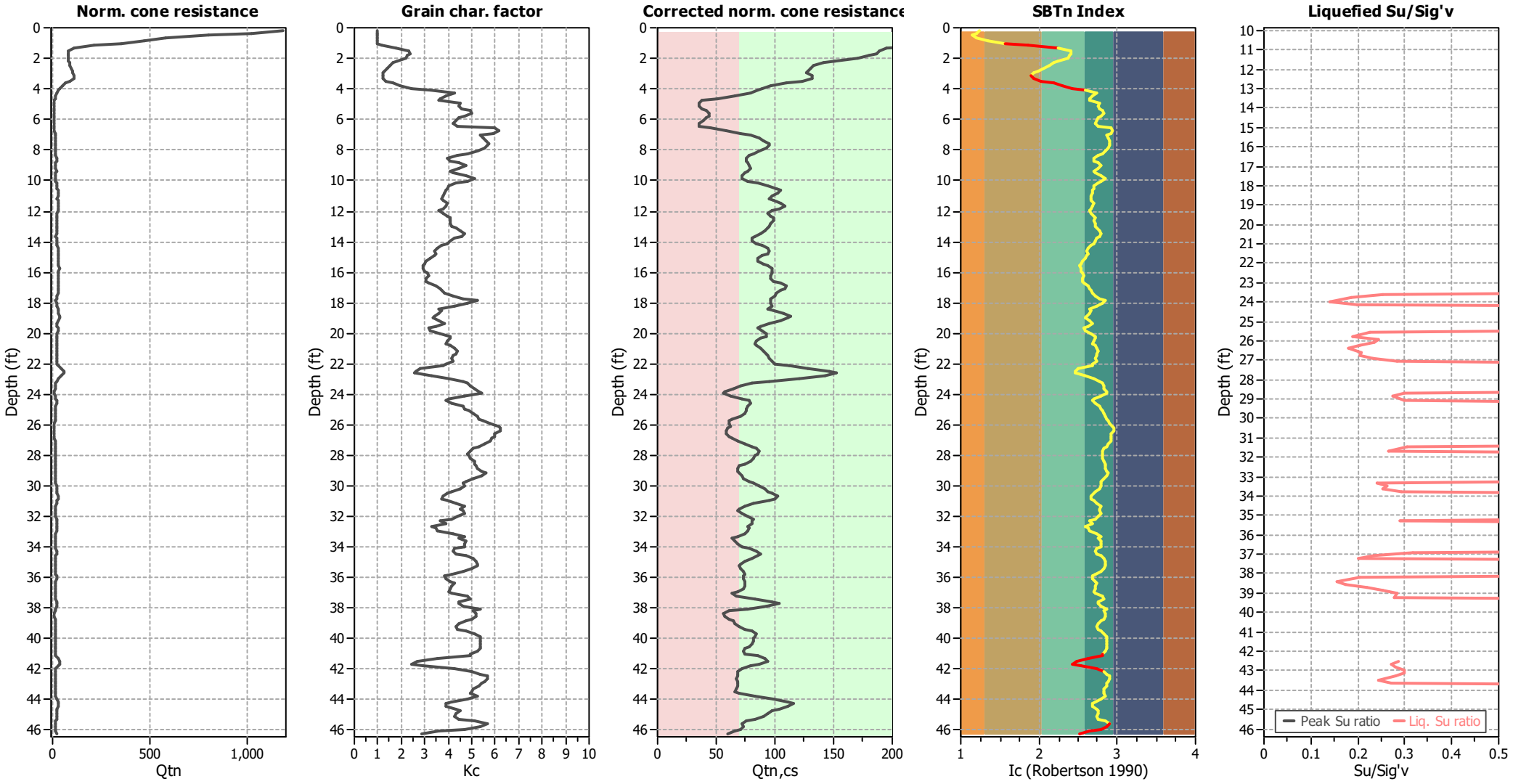




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

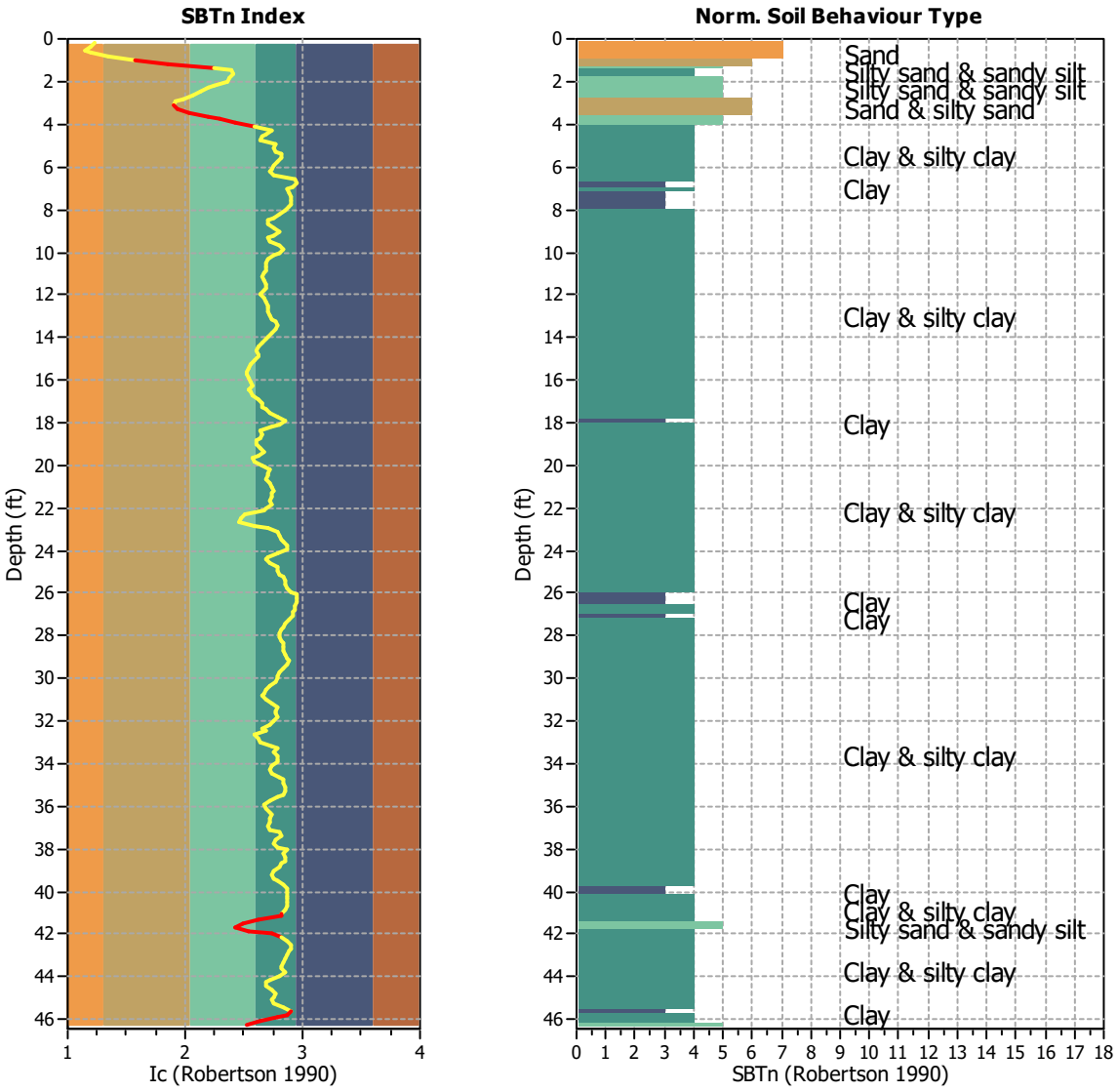
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.10	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.56	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	10.00 ft	Fill height:	N/A	Limit depth:	N/A

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties

I_c minimum check value:	1.70
I_c maximum check value:	3.00
I_c change ratio value:	0.0200
Minimum number of points in layer:	3

General statistics

Total points in CPT file:	282
Total points excluded:	23
Exclusion percentage:	8.16%
Number of layers detected:	5

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 1	3	Start depth: 1.15 (ft)	6	Sand & silty sand
		End depth: 1.48 (ft)	4	Clay & silty clay
Transition layer 2	7	Start depth: 3.28 (ft)	6	Sand & silty sand
		End depth: 4.27 (ft)	4	Clay & silty clay
Transition layer 3	4	Start depth: 41.18 (ft)	4	Clay & silty clay
		End depth: 41.67 (ft)	5	Silty sand & sandy silt
Transition layer 4	5	Start depth: 41.67 (ft)	5	Silty sand & sandy silt
		End depth: 42.32 (ft)	4	Clay & silty clay
Transition layer 5	4	Start depth: 45.77 (ft)	4	Clay & silty clay
		End depth: 46.26 (ft)	5	Silty sand & sandy silt

Start depth: Depth where the transition layer begins
End depth: Depth where the transition layer ends

:: Field input data ::

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1	0.16	745.00	6.71	6.86	0.00	137.28
2	0.33	715.77	5.12	4.64	0.00	137.19
3	0.49	448.36	1.99	3.28	0.00	133.19
4	0.66	330.55	1.57	3.62	0.00	129.50
5	0.82	305.89	2.28	4.91	0.94	129.25
6	0.98	236.01	2.21	3.95	3.82	129.39
7	1.15	110.85	2.31	4.12	9.33	127.92
8	1.31	51.46	2.04	3.39	20.56	125.91
9	1.48	41.84	1.88	5.60	26.45	124.64
10	1.64	58.82	1.85	7.03	27.05	124.38
11	1.80	46.10	1.91	3.90	25.72	123.99
12	1.97	44.95	1.54	4.32	24.97	123.28
13	2.13	56.33	1.39	1.80	20.80	121.77
14	2.30	55.98	0.93	-5.61	18.81	120.74
15	2.46	48.17	1.01	-0.91	16.60	119.66
16	2.63	61.85	0.91	0.93	14.64	119.02
17	2.79	65.34	0.64	0.82	12.47	118.22
18	2.95	60.03	0.70	1.03	10.99	117.50
19	3.12	69.87	0.67	1.30	10.47	117.93
20	3.28	76.07	0.72	0.73	11.19	118.32
21	3.45	55.97	0.83	0.74	13.82	117.89
22	3.61	39.46	0.66	0.99	18.63	116.16
23	3.77	29.54	0.45	1.55	22.20	113.71
24	3.94	25.83	0.41	1.38	27.51	111.27
25	4.10	13.58	0.35	1.05	34.55	109.39
26	4.27	10.73	0.28	1.23	42.30	106.87
27	4.43	11.38	0.19	0.98	39.74	103.23
28	4.59	10.10	0.04	-4.81	38.05	97.80
29	4.76	5.26	0.03	-3.55	37.62	90.30
30	4.92	5.19	0.03	-2.43	44.16	88.00
31	5.09	5.31	0.02	-2.39	43.69	88.05
32	5.25	5.49	0.03	-2.29	44.70	89.65
33	5.41	5.62	0.05	-2.16	46.99	91.91
34	5.58	5.66	0.06	-2.12	47.42	93.42
35	5.74	6.29	0.06	-2.00	45.57	93.23
36	5.91	6.35	0.05	-2.06	43.63	92.37
37	6.07	6.03	0.04	-1.97	42.63	90.54
38	6.23	5.62	0.03	-1.90	41.80	87.84
39	6.40	5.23	0.01	-1.85	43.47	87.36
40	6.56	5.00	0.03	-1.81	53.84	93.24
41	6.73	4.86	0.12	-1.71	55.03	99.15
42	6.89	8.85	0.20	0.42	53.31	103.43
43	7.05	9.85	0.27	0.08	49.82	106.01
44	7.22	10.13	0.32	-0.13	50.64	107.50
45	7.38	10.50	0.36	-0.14	51.60	108.43
46	7.55	10.66	0.39	-0.25	52.38	109.16
47	7.71	10.78	0.42	-0.28	51.98	109.40
48	7.87	11.21	0.39	-0.32	50.93	109.01

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
49	8.04	10.78	0.33	-0.19	48.89	107.88
50	8.20	10.47	0.26	-0.05	46.18	106.86
51	8.37	11.66	0.26	0.21	43.25	106.30
52	8.53	12.30	0.25	0.37	40.42	106.23
53	8.69	12.98	0.24	0.35	40.96	105.98
54	8.86	10.74	0.24	-0.07	43.81	105.87
55	9.02	9.63	0.26	-1.33	45.92	106.12
56	9.19	11.74	0.28	-2.12	43.83	106.62
57	9.35	13.31	0.27	-2.31	41.00	106.38
58	9.51	11.82	0.22	-2.91	41.97	105.46
59	9.68	9.34	0.20	-3.75	45.89	104.33
60	9.84	8.56	0.20	-4.14	48.41	104.27
61	10.01	10.07	0.22	-3.99	46.02	105.73
62	10.17	13.07	0.31	-3.47	43.05	108.08
63	10.34	15.03	0.42	-3.01	40.65	110.44
64	10.50	17.56	0.51	-2.73	40.19	111.84
65	10.66	17.09	0.53	-2.77	39.88	112.46
66	10.83	17.09	0.53	-2.44	39.45	112.07
67	10.99	17.10	0.43	-2.36	39.02	111.39
68	11.16	15.89	0.41	-2.20	38.29	110.80
69	11.32	16.59	0.43	-1.97	39.07	111.57
70	11.48	18.04	0.56	-1.92	40.12	112.46
71	11.65	16.89	0.58	-1.86	39.73	113.14
72	11.81	19.23	0.55	-1.78	38.97	112.67
73	11.98	18.02	0.46	-1.75	37.66	111.85
74	12.14	16.81	0.41	-1.76	38.69	111.01
75	12.30	15.60	0.43	-1.56	40.06	111.17
76	12.47	16.64	0.50	-1.63	41.06	111.63
77	12.63	16.78	0.50	-1.82	40.95	111.75
78	12.80	16.22	0.45	-1.85	41.08	111.32
79	12.96	15.55	0.43	-1.83	41.50	110.85
80	13.12	15.25	0.43	-1.88	42.89	110.53
81	13.29	13.91	0.41	-1.85	44.28	109.99
82	13.45	12.94	0.36	-1.87	45.24	109.03
83	13.62	12.45	0.31	-1.82	44.49	108.17
84	13.78	13.15	0.30	-1.64	42.54	107.90
85	13.94	14.56	0.31	-1.58	41.13	108.22
86	14.11	14.76	0.33	-1.53	40.19	109.22
87	14.27	16.58	0.41	-1.40	38.25	110.59
88	14.44	20.66	0.48	-1.35	36.89	111.96
89	14.60	20.86	0.52	-1.29	36.02	112.39
90	14.76	19.56	0.47	-1.28	36.68	112.12
91	14.93	18.85	0.44	-1.40	36.15	111.20
92	15.09	19.24	0.37	-1.21	34.78	110.86
93	15.26	21.12	0.40	-0.98	32.99	111.10
94	15.42	23.15	0.45	-0.77	32.49	112.32
95	15.58	24.49	0.55	-0.78	31.82	113.33
96	15.75	26.50	0.56	-0.65	32.05	113.97

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
97	15.91	25.24	0.57	-0.67	32.34	114.00
98	16.08	24.14	0.56	-0.71	33.43	113.87
99	16.24	23.68	0.56	-0.79	33.86	113.73
100	16.40	23.96	0.55	-0.72	32.92	113.75
101	16.57	26.52	0.55	-0.71	32.98	114.40
102	16.73	26.27	0.69	-0.68	34.02	115.28
103	16.90	25.25	0.77	-0.79	36.44	115.77
104	17.06	23.26	0.72	-0.91	37.74	115.36
105	17.22	22.19	0.61	-0.83	38.54	114.59
106	17.39	21.16	0.60	-0.84	39.53	113.95
107	17.55	19.50	0.59	-1.12	41.81	113.26
108	17.72	16.60	0.50	-1.21	44.98	112.22
109	17.88	14.15	0.44	-1.81	49.19	111.82
110	18.05	13.89	0.57	-1.36	46.12	112.19
111	18.21	21.02	0.53	-1.14	42.29	113.03
112	18.37	21.60	0.55	-1.65	37.52	113.16
113	18.54	22.25	0.52	-1.87	38.55	113.86
114	18.70	21.64	0.68	-1.38	37.51	115.60
115	18.87	30.07	0.93	-1.48	35.91	116.96
116	19.03	31.68	0.86	-2.35	35.35	116.86
117	19.19	22.78	0.64	-2.87	37.33	115.37
118	19.36	19.62	0.58	-2.58	39.26	113.35
119	19.52	21.07	0.44	-2.37	36.55	112.36
120	19.69	24.63	0.42	-1.84	33.86	112.21
121	19.85	24.62	0.51	-1.63	34.83	112.92
122	20.01	21.63	0.57	-1.63	38.16	113.28
123	20.18	19.56	0.53	-1.71	41.20	112.81
124	20.34	18.21	0.46	-1.68	41.05	111.96
125	20.51	19.54	0.42	-1.60	40.40	111.19
126	20.67	18.55	0.40	-1.56	39.95	110.90
127	20.83	18.24	0.41	-1.40	41.31	111.01
128	21.00	17.97	0.45	-1.40	42.62	111.72
129	21.16	18.71	0.53	-1.35	43.26	112.39
130	21.33	19.31	0.54	-1.32	42.87	112.98
131	21.49	20.34	0.55	-1.12	42.06	113.28
132	21.65	20.98	0.57	-1.09	41.72	113.73
133	21.82	21.39	0.62	-1.09	42.08	114.11
134	21.98	21.14	0.64	-1.11	39.92	114.89
135	22.15	27.50	0.71	-1.00	39.08	117.09
136	22.31	31.87	1.20	-1.00	30.74	121.02
137	22.47	67.70	1.83	-0.49	29.41	123.65
138	22.64	54.61	1.99	-1.59	29.07	124.38
139	22.80	40.67	1.63	-2.60	35.05	122.23
140	22.97	25.13	0.87	-3.16	40.60	118.47
141	23.13	18.57	0.53	-3.19	44.83	113.67
142	23.29	15.64	0.36	-2.98	46.31	110.22
143	23.46	14.39	0.29	-2.74	47.22	107.73
144	23.62	12.51	0.23	-2.67	48.23	105.56

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
145	23.79	11.00	0.17	-2.61	49.62	103.29
146	23.95	9.97	0.13	-2.46	50.34	102.47
147	24.11	10.98	0.18	-2.29	45.22	105.18
148	24.28	19.34	0.33	-2.02	40.88	108.91
149	24.44	22.68	0.45	-2.30	39.57	110.69
150	24.61	17.64	0.39	-1.70	41.44	110.86
151	24.77	17.08	0.37	-1.21	44.78	109.90
152	24.93	15.90	0.35	-1.04	45.24	109.41
153	25.10	16.07	0.33	-0.94	46.65	109.35
154	25.26	15.43	0.37	-0.76	47.70	108.95
155	25.43	14.04	0.31	-1.06	49.16	107.82
156	25.59	12.51	0.21	-1.02	49.35	105.80
157	25.76	11.84	0.18	-0.83	50.48	104.78
158	25.92	11.60	0.23	-0.80	52.46	104.80
159	26.08	11.12	0.22	-0.87	54.93	104.88
160	26.25	10.29	0.19	-0.81	55.32	104.11
161	26.41	10.39	0.17	-0.66	55.35	103.77
162	26.58	10.74	0.20	-0.58	53.75	103.91
163	26.74	11.59	0.20	-0.46	53.67	104.63
164	26.90	11.51	0.22	-0.40	52.85	105.63
165	27.07	12.87	0.27	-0.31	52.78	107.37
166	27.23	14.51	0.36	-0.26	50.94	109.13
167	27.40	16.44	0.41	-0.22	49.47	110.90
168	27.56	18.25	0.51	-0.03	47.81	112.02
169	27.72	19.25	0.53	0.07	46.90	112.61
170	27.89	19.27	0.51	0.80	46.21	112.48
171	28.05	18.91	0.48	0.92	46.55	112.01
172	28.22	17.64	0.45	0.97	47.09	111.60
173	28.38	17.65	0.45	1.10	48.12	110.82
174	28.54	15.88	0.36	0.98	48.38	109.79
175	28.71	15.09	0.30	1.26	48.55	108.44
176	28.87	14.73	0.28	1.21	49.11	107.87
177	29.04	14.30	0.30	1.28	50.32	107.97
178	29.20	14.21	0.32	1.28	51.38	108.35
179	29.36	14.56	0.33	1.30	50.06	108.92
180	29.53	16.78	0.36	1.45	47.86	109.78
181	29.69	18.47	0.41	1.51	45.90	111.12
182	29.86	20.24	0.50	1.67	45.16	112.17
183	30.02	20.70	0.52	1.54	45.28	113.26
184	30.18	21.60	0.61	1.59	44.10	114.43
185	30.35	25.91	0.73	1.77	41.75	115.47
186	30.51	28.67	0.73	1.37	40.23	116.20
187	30.68	27.69	0.78	1.70	38.64	117.41
188	30.84	35.00	1.04	1.62	38.41	117.14
189	31.00	28.19	0.64	-0.93	40.05	115.97
190	31.17	19.05	0.48	1.52	42.66	112.86
191	31.33	19.11	0.40	2.18	45.32	110.78
192	31.50	18.44	0.33	2.40	44.19	109.43

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
193	31.66	17.26	0.29	2.65	44.77	108.85
194	31.82	17.10	0.33	2.90	45.36	109.92
195	31.99	20.35	0.47	3.03	43.08	111.73
196	32.15	25.38	0.53	2.21	41.39	113.08
197	32.32	24.16	0.55	2.65	38.07	113.39
198	32.48	27.88	0.48	2.00	39.62	113.03
199	32.64	21.21	0.48	2.27	35.24	112.91
200	32.81	32.92	0.46	3.03	36.47	113.16
201	32.97	26.29	0.54	0.63	37.23	112.74
202	33.14	18.18	0.42	1.30	42.19	111.19
203	33.30	19.12	0.27	1.92	45.28	109.18
204	33.47	16.80	0.30	2.20	43.76	108.12
205	33.63	17.73	0.29	2.44	45.62	108.57
206	33.79	17.91	0.33	2.84	45.23	109.36
207	33.96	19.21	0.39	3.19	45.25	110.57
208	34.12	20.84	0.45	3.38	42.58	112.44
209	34.28	27.31	0.60	3.47	41.83	114.04
210	34.45	25.97	0.68	3.38	42.79	114.83
211	34.61	22.11	0.63	0.64	45.86	114.06
212	34.78	19.70	0.47	0.59	48.02	112.63
213	34.94	18.71	0.42	0.81	48.46	111.06
214	35.11	17.50	0.37	0.97	49.09	110.15
215	35.27	16.84	0.34	1.24	49.03	109.71
216	35.43	17.86	0.36	1.49	47.64	110.18
217	35.60	20.32	0.42	1.82	45.06	111.13
218	35.76	22.78	0.45	2.05	41.72	111.79
219	35.93	25.00	0.43	2.21	39.39	111.99
220	36.09	25.16	0.43	2.45	39.75	111.94
221	36.25	22.09	0.45	2.50	41.26	111.92
222	36.42	22.37	0.44	2.78	42.59	112.00
223	36.58	23.32	0.46	2.99	41.36	112.05
224	36.75	24.43	0.44	3.02	41.17	111.73
225	36.91	21.80	0.38	3.15	40.65	110.61
226	37.07	20.89	0.29	3.28	41.75	108.93
227	37.24	18.14	0.25	3.63	46.13	109.59
228	37.40	17.54	0.49	4.01	47.23	113.84
229	37.57	31.32	0.99	3.68	43.91	117.26
230	37.73	36.64	1.06	-1.58	43.73	118.32
231	37.89	22.90	0.84	-2.87	45.10	116.19
232	38.06	19.84	0.36	-1.78	49.84	112.26
233	38.22	16.82	0.25	-1.56	47.66	107.62
234	38.39	14.49	0.20	-1.12	48.80	105.95
235	38.55	15.41	0.22	-0.69	48.72	106.20
236	38.71	17.44	0.27	-0.39	47.35	107.63
237	38.88	18.90	0.32	-0.11	45.87	109.04
238	39.04	20.45	0.36	0.21	43.67	109.82
239	39.21	22.51	0.35	0.43	42.65	110.88
240	39.37	23.50	0.45	0.78	43.08	112.34

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
241	39.53	24.30	0.59	0.84	45.70	113.73
242	39.70	22.88	0.64	0.68	48.19	114.32
243	39.86	21.73	0.61	0.79	49.71	114.15
244	40.03	21.69	0.57	0.86	49.96	113.85
245	40.19	21.73	0.58	0.92	49.77	113.66
246	40.35	21.53	0.57	0.96	49.76	113.46
247	40.52	21.21	0.53	1.01	49.93	112.79
248	40.68	19.69	0.45	1.13	50.04	111.98
249	40.85	19.27	0.42	1.31	49.01	111.66
250	41.01	21.73	0.46	1.82	47.06	112.18
251	41.18	23.88	0.51	1.88	47.09	114.92
252	41.34	28.06	0.97	2.10	36.89	117.41
253	41.50	54.31	0.94	0.31	30.04	119.05
254	41.67	57.66	0.86	-2.58	27.67	117.93
255	41.83	30.77	0.56	-2.83	32.27	115.53
256	42.00	22.37	0.43	-1.86	42.24	112.26
257	42.16	20.48	0.37	-1.13	47.47	110.88
258	42.32	18.80	0.40	-0.67	49.90	110.47
259	42.49	18.34	0.39	-0.18	51.83	110.39
260	42.65	18.14	0.37	0.08	51.71	110.28
261	42.82	18.75	0.38	0.38	50.94	110.47
262	42.98	19.75	0.41	0.67	50.10	110.80
263	43.14	20.05	0.41	0.77	49.54	110.86
264	43.31	19.67	0.38	1.02	47.94	110.44
265	43.47	20.79	0.33	1.24	47.41	110.22
266	43.64	20.27	0.37	1.61	47.21	111.32
267	43.80	22.97	0.54	2.06	49.07	114.68
268	43.96	28.47	0.99	2.22	46.06	118.29
269	44.13	39.71	1.35	2.53	41.44	120.98
270	44.29	48.29	1.49	0.64	39.77	121.91
271	44.46	39.51	1.38	0.52	39.73	121.27
272	44.62	35.85	1.03	0.95	42.70	119.63
273	44.78	30.65	0.87	1.65	43.96	118.39
274	44.95	30.41	0.95	2.02	43.04	117.89
275	45.11	35.64	0.85	2.21	42.45	117.27
276	45.28	29.20	0.67	1.42	43.64	115.38
277	45.44	19.98	0.47	1.70	48.37	113.19
278	45.60	20.05	0.44	2.52	51.75	112.10
279	45.77	21.60	0.50	2.82	49.83	112.65
280	45.93	24.09	0.54	3.22	45.27	112.32
281	46.10	25.81	0.33	3.51	37.59	111.71
282	46.26	33.80	0.33	3.84	31.77	110.54

Abbreviations

Depth:	Depth from free surface, at which CPT was performed (ft)
q_c:	Measured cone resistance (tsf)
f_s:	Sleeve friction resistance (tsf)
u:	Pore pressure (tsf)
Fines content:	Percentage of fines in soil (%)
Unit weight:	Bulk soil unit weight (pcf)

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1	0.16	0.01	0.00	0.01	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
2	0.33	0.02	0.00	0.02	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
3	0.49	0.03	0.00	0.03	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
4	0.66	0.04	0.00	0.04	1.00	0.364	1.15	0.317	1.00	1.00	2.000	No
5	0.82	0.05	0.00	0.05	1.00	0.364	1.15	0.316	1.00	1.00	2.000	No
6	0.98	0.07	0.00	0.07	1.00	0.364	1.15	0.316	1.00	1.00	2.000	No
7	1.15	0.08	0.00	0.08	1.00	0.364	1.15	0.316	1.00	1.00	2.000	Yes
8	1.31	0.09	0.00	0.09	1.00	0.364	1.15	0.316	1.00	1.00	2.000	Yes
9	1.48	0.10	0.00	0.10	1.00	0.363	1.15	0.316	1.00	1.00	2.000	Yes
10	1.64	0.11	0.00	0.11	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
11	1.80	0.12	0.00	0.12	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
12	1.97	0.13	0.00	0.13	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
13	2.13	0.14	0.00	0.14	1.00	0.363	1.15	0.316	1.00	1.00	2.000	No
14	2.30	0.15	0.00	0.15	1.00	0.363	1.15	0.315	1.00	1.00	2.000	No
15	2.46	0.16	0.00	0.16	1.00	0.363	1.15	0.315	1.00	1.00	2.000	No
16	2.63	0.17	0.00	0.17	1.00	0.362	1.15	0.315	1.00	1.00	2.000	No
17	2.79	0.18	0.00	0.18	1.00	0.362	1.15	0.315	1.00	1.00	2.000	No
18	2.95	0.19	0.00	0.19	1.00	0.362	1.15	0.315	1.00	1.00	2.000	No
19	3.12	0.20	0.00	0.20	0.99	0.362	1.15	0.315	1.00	1.00	2.000	No
20	3.28	0.20	0.00	0.20	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
21	3.45	0.21	0.00	0.21	0.99	0.362	1.15	0.315	1.00	1.00	2.000	Yes
22	3.61	0.22	0.00	0.22	0.99	0.362	1.15	0.314	1.00	1.00	2.000	Yes
23	3.77	0.23	0.00	0.23	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
24	3.94	0.24	0.00	0.24	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
25	4.10	0.25	0.00	0.25	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
26	4.27	0.26	0.00	0.26	0.99	0.361	1.15	0.314	1.00	1.00	2.000	Yes
27	4.43	0.27	0.00	0.27	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
28	4.59	0.28	0.00	0.28	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
29	4.76	0.28	0.00	0.28	0.99	0.361	1.15	0.314	1.00	1.00	2.000	No
30	4.92	0.29	0.00	0.29	0.99	0.361	1.15	0.313	1.00	1.00	2.000	No
31	5.09	0.30	0.00	0.30	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
32	5.25	0.31	0.00	0.31	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
33	5.41	0.31	0.00	0.31	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
34	5.58	0.32	0.00	0.32	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
35	5.74	0.33	0.00	0.33	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
36	5.91	0.34	0.00	0.34	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
37	6.07	0.34	0.00	0.34	0.99	0.360	1.15	0.313	1.00	1.00	2.000	No
38	6.23	0.35	0.00	0.35	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
39	6.40	0.36	0.00	0.36	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
40	6.56	0.37	0.00	0.37	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
41	6.73	0.37	0.00	0.37	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
42	6.89	0.38	0.00	0.38	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
43	7.05	0.39	0.00	0.39	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
44	7.22	0.40	0.00	0.40	0.99	0.359	1.15	0.312	1.00	1.00	2.000	No
45	7.38	0.41	0.00	0.41	0.98	0.358	1.15	0.312	1.00	1.00	2.000	No
46	7.55	0.42	0.00	0.42	0.98	0.358	1.15	0.312	1.00	1.00	2.000	No
47	7.71	0.43	0.00	0.43	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
48	7.87	0.44	0.00	0.44	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
49	8.04	0.44	0.00	0.44	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
50	8.20	0.45	0.00	0.45	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
51	8.37	0.46	0.00	0.46	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
52	8.53	0.47	0.00	0.47	0.98	0.358	1.15	0.311	1.00	1.00	2.000	No
53	8.69	0.48	0.00	0.48	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
54	8.86	0.49	0.00	0.49	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
55	9.02	0.50	0.00	0.50	0.98	0.357	1.15	0.311	1.00	1.00	2.000	No
56	9.19	0.51	0.00	0.51	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
57	9.35	0.51	0.00	0.51	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
58	9.51	0.52	0.00	0.52	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
59	9.68	0.53	0.00	0.53	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
60	9.84	0.54	0.00	0.54	0.98	0.357	1.15	0.310	1.00	1.00	2.000	No
61	10.01	0.55	0.00	0.55	0.98	0.357	1.15	0.310	1.00	1.00	0.310	No
62	10.17	0.56	0.01	0.55	0.98	0.360	1.15	0.313	1.00	1.00	0.313	No
63	10.34	0.57	0.01	0.56	0.98	0.363	1.15	0.315	1.00	1.00	0.315	No
64	10.50	0.58	0.02	0.56	0.98	0.366	1.15	0.318	1.00	1.00	0.318	No
65	10.66	0.59	0.02	0.56	0.98	0.369	1.15	0.321	1.00	1.00	0.321	No
66	10.83	0.59	0.03	0.57	0.98	0.372	1.15	0.323	1.00	1.00	0.323	No
67	10.99	0.60	0.03	0.57	0.98	0.375	1.15	0.326	1.00	1.00	0.326	No
68	11.16	0.61	0.04	0.58	0.98	0.378	1.15	0.328	1.00	1.00	0.328	No
69	11.32	0.62	0.04	0.58	0.98	0.381	1.15	0.331	1.00	1.00	0.331	No
70	11.48	0.63	0.05	0.58	0.98	0.383	1.15	0.333	1.00	1.00	0.333	No
71	11.65	0.64	0.05	0.59	0.98	0.386	1.15	0.336	1.00	1.00	0.336	No
72	11.81	0.65	0.06	0.59	0.98	0.389	1.15	0.338	1.00	1.00	0.338	No
73	11.98	0.66	0.06	0.60	0.97	0.392	1.15	0.340	1.00	1.00	0.340	No
74	12.14	0.67	0.07	0.60	0.97	0.394	1.15	0.343	1.00	1.00	0.343	No
75	12.30	0.68	0.07	0.61	0.97	0.397	1.15	0.345	1.00	1.00	0.345	No
76	12.47	0.69	0.08	0.61	0.97	0.399	1.15	0.347	1.00	1.00	0.347	No
77	12.63	0.70	0.08	0.61	0.97	0.402	1.15	0.349	1.00	1.00	0.349	No
78	12.80	0.70	0.09	0.62	0.97	0.404	1.15	0.352	1.00	1.00	0.352	No
79	12.96	0.71	0.09	0.62	0.97	0.407	1.15	0.354	1.00	1.00	0.354	No
80	13.12	0.72	0.10	0.63	0.97	0.409	1.15	0.356	1.00	1.00	0.356	No
81	13.29	0.73	0.10	0.63	0.97	0.412	1.15	0.358	1.00	1.00	0.358	No
82	13.45	0.74	0.11	0.63	0.97	0.414	1.15	0.360	1.00	1.00	0.360	No
83	13.62	0.75	0.11	0.64	0.97	0.416	1.15	0.362	1.00	1.00	0.362	No
84	13.78	0.76	0.12	0.64	0.97	0.419	1.15	0.364	1.00	1.00	0.364	No
85	13.94	0.77	0.12	0.64	0.97	0.421	1.15	0.366	1.00	1.00	0.366	No
86	14.11	0.78	0.13	0.65	0.97	0.423	1.15	0.368	1.00	1.00	0.368	No
87	14.27	0.79	0.13	0.65	0.97	0.425	1.15	0.370	1.00	1.00	0.370	No
88	14.44	0.79	0.14	0.66	0.97	0.427	1.15	0.372	1.00	1.00	0.372	No
89	14.60	0.80	0.14	0.66	0.97	0.430	1.15	0.374	1.00	1.00	0.374	No
90	14.76	0.81	0.15	0.66	0.97	0.432	1.15	0.375	1.00	1.00	0.375	No
91	14.93	0.82	0.15	0.67	0.97	0.434	1.15	0.377	1.00	1.00	0.377	No
92	15.09	0.83	0.16	0.67	0.97	0.436	1.15	0.379	1.00	1.00	0.379	No
93	15.26	0.84	0.16	0.68	0.97	0.438	1.15	0.381	1.00	1.00	0.381	No
94	15.42	0.85	0.17	0.68	0.97	0.440	1.15	0.382	1.00	1.00	0.382	No
95	15.58	0.86	0.17	0.68	0.97	0.442	1.15	0.384	1.00	1.00	0.384	No
96	15.75	0.87	0.18	0.69	0.97	0.444	1.15	0.386	1.00	1.00	0.386	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
97	15.91	0.88	0.18	0.69	0.97	0.446	1.15	0.387	1.00	1.00	0.387	No
98	16.08	0.89	0.19	0.70	0.97	0.447	1.15	0.389	1.00	1.00	0.389	No
99	16.24	0.90	0.19	0.70	0.97	0.449	1.15	0.391	1.00	1.00	0.391	No
100	16.40	0.91	0.20	0.71	0.97	0.451	1.15	0.392	1.00	1.00	0.392	No
101	16.57	0.91	0.20	0.71	0.97	0.453	1.15	0.394	1.00	1.00	0.394	No
102	16.73	0.92	0.21	0.71	0.96	0.454	1.15	0.395	1.00	1.00	0.395	No
103	16.90	0.93	0.22	0.72	0.96	0.456	1.15	0.397	1.00	1.00	0.397	No
104	17.06	0.94	0.22	0.72	0.96	0.458	1.15	0.398	1.00	1.00	0.398	No
105	17.22	0.95	0.23	0.73	0.96	0.460	1.15	0.399	1.00	1.00	0.399	No
106	17.39	0.96	0.23	0.73	0.96	0.461	1.15	0.401	1.00	1.00	0.401	No
107	17.55	0.97	0.24	0.74	0.96	0.463	1.15	0.402	1.00	1.00	0.402	No
108	17.72	0.98	0.24	0.74	0.96	0.464	1.15	0.404	1.00	1.00	0.404	No
109	17.88	0.99	0.25	0.74	0.96	0.466	1.15	0.405	1.00	1.00	0.405	No
110	18.05	1.00	0.25	0.75	0.96	0.468	1.15	0.407	1.00	1.00	0.407	No
111	18.21	1.01	0.26	0.75	0.96	0.469	1.15	0.408	1.00	1.00	0.408	No
112	18.37	1.02	0.26	0.76	0.96	0.471	1.15	0.409	1.00	1.00	0.409	No
113	18.54	1.03	0.27	0.76	0.96	0.472	1.15	0.410	1.00	1.00	0.410	No
114	18.70	1.04	0.27	0.76	0.96	0.474	1.15	0.412	1.00	1.00	0.412	No
115	18.87	1.05	0.28	0.77	0.96	0.475	1.15	0.413	1.00	1.00	0.413	No
116	19.03	1.06	0.28	0.77	0.96	0.476	1.15	0.414	1.00	1.00	0.414	No
117	19.19	1.06	0.29	0.78	0.96	0.478	1.15	0.415	1.00	1.00	0.415	No
118	19.36	1.07	0.29	0.78	0.96	0.479	1.15	0.417	1.00	1.00	0.417	No
119	19.52	1.08	0.30	0.79	0.96	0.481	1.15	0.418	1.00	1.00	0.418	No
120	19.69	1.09	0.30	0.79	0.96	0.482	1.15	0.419	1.00	1.00	0.419	No
121	19.85	1.10	0.31	0.79	0.96	0.483	1.15	0.420	1.00	1.00	0.420	No
122	20.01	1.11	0.31	0.80	0.96	0.485	1.15	0.421	1.00	1.00	0.421	No
123	20.18	1.12	0.32	0.80	0.96	0.486	1.15	0.422	1.00	1.00	0.422	No
124	20.34	1.13	0.32	0.81	0.96	0.487	1.15	0.424	1.00	1.00	0.424	No
125	20.51	1.14	0.33	0.81	0.96	0.488	1.15	0.425	1.00	1.00	0.425	No
126	20.67	1.15	0.33	0.81	0.96	0.490	1.15	0.426	1.00	1.00	0.426	No
127	20.83	1.16	0.34	0.82	0.95	0.491	1.15	0.427	1.00	1.00	0.427	No
128	21.00	1.17	0.34	0.82	0.95	0.492	1.15	0.428	1.00	1.00	0.428	No
129	21.16	1.18	0.35	0.83	0.95	0.493	1.15	0.429	1.00	1.00	0.429	No
130	21.33	1.18	0.35	0.83	0.95	0.495	1.15	0.430	1.00	1.00	0.430	No
131	21.49	1.19	0.36	0.84	0.95	0.496	1.15	0.431	1.00	1.00	0.431	No
132	21.65	1.20	0.36	0.84	0.95	0.497	1.15	0.432	1.00	1.00	0.432	No
133	21.82	1.21	0.37	0.84	0.95	0.498	1.15	0.433	1.00	1.00	0.433	No
134	21.98	1.22	0.37	0.85	0.95	0.499	1.15	0.434	1.00	1.00	0.434	No
135	22.15	1.23	0.38	0.85	0.95	0.500	1.15	0.435	1.00	1.00	0.435	No
136	22.31	1.24	0.38	0.86	0.95	0.501	1.15	0.436	1.00	1.00	0.436	No
137	22.47	1.25	0.39	0.86	0.95	0.502	1.15	0.436	1.00	1.00	0.436	No
138	22.64	1.26	0.39	0.87	0.95	0.503	1.15	0.437	1.00	1.00	0.437	No
139	22.80	1.27	0.40	0.87	0.95	0.504	1.15	0.438	1.00	1.00	0.438	No
140	22.97	1.28	0.40	0.88	0.95	0.505	1.15	0.439	1.00	1.00	0.439	No
141	23.13	1.29	0.41	0.88	0.95	0.506	1.15	0.440	1.00	1.00	0.440	No
142	23.29	1.30	0.41	0.88	0.95	0.507	1.15	0.440	1.00	1.00	0.440	No
143	23.46	1.31	0.42	0.89	0.95	0.508	1.15	0.441	1.00	1.00	0.441	No
144	23.62	1.32	0.43	0.89	0.95	0.509	1.15	0.442	1.00	1.00	0.442	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
145	23.79	1.33	0.43	0.90	0.95	0.510	1.15	0.443	1.00	1.00	0.443	No
146	23.95	1.33	0.44	0.90	0.95	0.511	1.15	0.444	1.00	1.00	0.444	No
147	24.11	1.34	0.44	0.90	0.94	0.512	1.15	0.445	1.00	1.00	0.445	No
148	24.28	1.35	0.45	0.91	0.94	0.513	1.15	0.446	1.00	1.00	0.446	No
149	24.44	1.36	0.45	0.91	0.94	0.514	1.15	0.447	1.00	1.00	0.447	No
150	24.61	1.37	0.46	0.91	0.94	0.514	1.15	0.447	1.00	1.00	0.447	No
151	24.77	1.38	0.46	0.92	0.94	0.515	1.15	0.448	1.00	1.00	0.448	No
152	24.93	1.39	0.47	0.92	0.94	0.516	1.15	0.449	1.00	1.00	0.449	No
153	25.10	1.40	0.47	0.93	0.94	0.517	1.15	0.450	1.00	1.00	0.450	No
154	25.26	1.41	0.48	0.93	0.94	0.518	1.15	0.450	1.00	1.00	0.450	No
155	25.43	1.41	0.48	0.93	0.94	0.519	1.15	0.451	1.00	1.00	0.451	No
156	25.59	1.42	0.49	0.94	0.94	0.520	1.15	0.452	1.00	1.00	0.452	No
157	25.76	1.43	0.49	0.94	0.94	0.521	1.15	0.453	1.00	1.00	0.453	No
158	25.92	1.44	0.50	0.94	0.94	0.521	1.15	0.453	1.00	1.00	0.453	No
159	26.08	1.45	0.50	0.95	0.94	0.522	1.15	0.454	1.00	1.00	0.454	No
160	26.25	1.46	0.51	0.95	0.94	0.523	1.15	0.455	1.00	1.00	0.455	No
161	26.41	1.47	0.51	0.95	0.94	0.524	1.15	0.455	1.00	1.00	0.455	No
162	26.58	1.47	0.52	0.96	0.94	0.525	1.15	0.456	1.00	1.00	0.456	No
163	26.74	1.48	0.52	0.96	0.94	0.525	1.15	0.457	1.00	1.00	0.457	No
164	26.90	1.49	0.53	0.96	0.93	0.526	1.15	0.458	1.00	1.00	0.458	No
165	27.07	1.50	0.53	0.97	0.93	0.527	1.15	0.458	1.00	1.00	0.458	No
166	27.23	1.51	0.54	0.97	0.93	0.528	1.15	0.459	1.00	1.00	0.459	No
167	27.40	1.52	0.54	0.98	0.93	0.528	1.15	0.459	1.00	1.00	0.459	No
168	27.56	1.53	0.55	0.98	0.93	0.529	1.15	0.460	1.00	1.00	0.460	No
169	27.72	1.54	0.55	0.98	0.93	0.529	1.15	0.460	1.00	1.00	0.460	No
170	27.89	1.55	0.56	0.99	0.93	0.530	1.15	0.461	1.00	1.00	0.461	No
171	28.05	1.56	0.56	0.99	0.93	0.531	1.15	0.461	1.00	1.00	0.461	No
172	28.22	1.56	0.57	1.00	0.93	0.531	1.15	0.462	1.00	1.00	0.462	No
173	28.38	1.57	0.57	1.00	0.93	0.532	1.15	0.462	1.00	1.00	0.462	No
174	28.54	1.58	0.58	1.00	0.93	0.532	1.15	0.463	1.00	1.00	0.463	No
175	28.71	1.59	0.58	1.01	0.93	0.533	1.15	0.463	1.00	1.00	0.463	No
176	28.87	1.60	0.59	1.01	0.93	0.533	1.15	0.464	1.00	1.00	0.464	No
177	29.04	1.61	0.59	1.02	0.93	0.534	1.15	0.464	1.00	1.00	0.464	No
178	29.20	1.62	0.60	1.02	0.92	0.534	1.15	0.465	1.00	1.00	0.465	No
179	29.36	1.63	0.60	1.02	0.92	0.535	1.15	0.465	1.00	1.00	0.465	No
180	29.53	1.64	0.61	1.03	0.92	0.535	1.15	0.465	1.00	1.00	0.465	No
181	29.69	1.65	0.61	1.03	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
182	29.86	1.65	0.62	1.03	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
183	30.02	1.66	0.62	1.04	0.92	0.536	1.15	0.466	1.00	1.00	0.466	No
184	30.18	1.67	0.63	1.04	0.92	0.537	1.15	0.467	1.00	1.00	0.467	No
185	30.35	1.68	0.63	1.05	0.92	0.537	1.15	0.467	1.00	1.00	0.467	No
186	30.51	1.69	0.64	1.05	0.92	0.537	1.15	0.467	1.00	1.00	0.467	No
187	30.68	1.70	0.65	1.06	0.92	0.538	1.15	0.467	1.00	1.00	0.467	No
188	30.84	1.71	0.65	1.06	0.92	0.538	1.15	0.468	1.00	1.00	0.468	No
189	31.00	1.72	0.66	1.07	0.92	0.538	1.15	0.468	1.00	1.00	0.469	No
190	31.17	1.73	0.66	1.07	0.91	0.538	1.15	0.468	1.00	1.00	0.469	No
191	31.33	1.74	0.67	1.07	0.91	0.539	1.15	0.468	1.00	1.00	0.470	No
192	31.50	1.75	0.67	1.08	0.91	0.539	1.15	0.469	1.00	1.00	0.471	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
193	31.66	1.76	0.68	1.08	0.91	0.539	1.15	0.469	1.00	1.00	0.471	No
194	31.82	1.77	0.68	1.09	0.91	0.540	1.15	0.469	0.99	1.00	0.472	No
195	31.99	1.78	0.69	1.09	0.91	0.540	1.15	0.469	0.99	1.00	0.472	No
196	32.15	1.78	0.69	1.09	0.91	0.540	1.15	0.469	0.99	1.00	0.473	No
197	32.32	1.79	0.70	1.10	0.91	0.540	1.15	0.470	0.99	1.00	0.474	No
198	32.48	1.80	0.70	1.10	0.91	0.540	1.15	0.470	0.99	1.00	0.474	No
199	32.64	1.81	0.71	1.11	0.91	0.540	1.15	0.470	0.99	1.00	0.475	No
200	32.81	1.82	0.71	1.11	0.90	0.541	1.15	0.470	0.99	1.00	0.475	No
201	32.97	1.83	0.72	1.11	0.90	0.541	1.15	0.470	0.99	1.00	0.476	No
202	33.14	1.84	0.72	1.12	0.90	0.541	1.15	0.470	0.99	1.00	0.476	No
203	33.30	1.85	0.73	1.12	0.90	0.541	1.15	0.470	0.99	1.00	0.477	No
204	33.47	1.86	0.73	1.13	0.90	0.541	1.15	0.470	0.99	1.00	0.477	No
205	33.63	1.87	0.74	1.13	0.90	0.541	1.15	0.471	0.99	1.00	0.478	No
206	33.79	1.88	0.74	1.13	0.90	0.541	1.15	0.471	0.98	1.00	0.478	No
207	33.96	1.88	0.75	1.14	0.90	0.541	1.15	0.471	0.98	1.00	0.479	No
208	34.12	1.89	0.75	1.14	0.90	0.542	1.15	0.471	0.98	1.00	0.479	No
209	34.28	1.90	0.76	1.15	0.90	0.542	1.15	0.471	0.98	1.00	0.479	No
210	34.45	1.91	0.76	1.15	0.89	0.541	1.15	0.471	0.98	1.00	0.480	No
211	34.61	1.92	0.77	1.15	0.89	0.541	1.15	0.471	0.98	1.00	0.480	No
212	34.78	1.93	0.77	1.16	0.89	0.541	1.15	0.471	0.98	1.00	0.481	No
213	34.94	1.94	0.78	1.16	0.89	0.541	1.15	0.471	0.98	1.00	0.481	No
214	35.11	1.95	0.78	1.17	0.89	0.541	1.15	0.471	0.98	1.00	0.481	No
215	35.27	1.96	0.79	1.17	0.89	0.541	1.15	0.471	0.98	1.00	0.482	No
216	35.43	1.97	0.79	1.17	0.89	0.541	1.15	0.471	0.98	1.00	0.482	No
217	35.60	1.98	0.80	1.18	0.89	0.541	1.15	0.471	0.98	1.00	0.482	No
218	35.76	1.99	0.80	1.18	0.89	0.541	1.15	0.471	0.97	1.00	0.483	No
219	35.93	2.00	0.81	1.19	0.88	0.541	1.15	0.471	0.97	1.00	0.483	No
220	36.09	2.00	0.81	1.19	0.88	0.541	1.15	0.470	0.97	1.00	0.483	No
221	36.25	2.01	0.82	1.19	0.88	0.541	1.15	0.470	0.97	1.00	0.484	No
222	36.42	2.02	0.82	1.20	0.88	0.541	1.15	0.470	0.97	1.00	0.484	No
223	36.58	2.03	0.83	1.20	0.88	0.541	1.15	0.470	0.97	1.00	0.484	No
224	36.75	2.04	0.83	1.21	0.88	0.541	1.15	0.470	0.97	1.00	0.484	No
225	36.91	2.05	0.84	1.21	0.88	0.540	1.15	0.470	0.97	1.00	0.485	No
226	37.07	2.06	0.84	1.21	0.88	0.540	1.15	0.470	0.97	1.00	0.485	No
227	37.24	2.07	0.85	1.22	0.87	0.540	1.15	0.470	0.97	1.00	0.485	No
228	37.40	2.08	0.85	1.22	0.87	0.540	1.15	0.469	0.97	1.00	0.485	No
229	37.57	2.09	0.86	1.23	0.87	0.540	1.15	0.469	0.97	1.00	0.485	No
230	37.73	2.10	0.87	1.23	0.87	0.539	1.15	0.469	0.97	1.00	0.485	No
231	37.89	2.11	0.87	1.24	0.87	0.539	1.15	0.469	0.96	1.00	0.486	No
232	38.06	2.12	0.88	1.24	0.87	0.539	1.15	0.468	0.96	1.00	0.486	No
233	38.22	2.12	0.88	1.24	0.87	0.539	1.15	0.468	0.96	1.00	0.486	No
234	38.39	2.13	0.89	1.25	0.86	0.538	1.15	0.468	0.96	1.00	0.486	No
235	38.55	2.14	0.89	1.25	0.86	0.538	1.15	0.468	0.96	1.00	0.486	No
236	38.71	2.15	0.90	1.25	0.86	0.538	1.15	0.468	0.96	1.00	0.486	No
237	38.88	2.16	0.90	1.26	0.86	0.538	1.15	0.467	0.96	1.00	0.486	No
238	39.04	2.17	0.91	1.26	0.86	0.537	1.15	0.467	0.96	1.00	0.487	No
239	39.21	2.18	0.91	1.27	0.86	0.537	1.15	0.467	0.96	1.00	0.487	No
240	39.37	2.19	0.92	1.27	0.86	0.537	1.15	0.467	0.96	1.00	0.487	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
241	39.53	2.20	0.92	1.27	0.86	0.536	1.15	0.466	0.96	1.00	0.487	No
242	39.70	2.21	0.93	1.28	0.85	0.536	1.15	0.466	0.96	1.00	0.487	No
243	39.86	2.21	0.93	1.28	0.85	0.535	1.15	0.466	0.96	1.00	0.487	No
244	40.03	2.22	0.94	1.29	0.85	0.535	1.15	0.465	0.96	1.00	0.487	No
245	40.19	2.23	0.94	1.29	0.85	0.535	1.15	0.465	0.96	1.00	0.487	No
246	40.35	2.24	0.95	1.30	0.85	0.534	1.15	0.464	0.95	1.00	0.487	No
247	40.52	2.25	0.95	1.30	0.85	0.534	1.15	0.464	0.95	1.00	0.487	No
248	40.68	2.26	0.96	1.30	0.84	0.533	1.15	0.464	0.95	1.00	0.487	No
249	40.85	2.27	0.96	1.31	0.84	0.533	1.15	0.463	0.95	1.00	0.486	No
250	41.01	2.28	0.97	1.31	0.84	0.532	1.15	0.463	0.95	1.00	0.486	No
251	41.18	2.29	0.97	1.32	0.84	0.532	1.15	0.463	0.95	1.00	2.000	Yes
252	41.34	2.30	0.98	1.32	0.84	0.531	1.15	0.462	0.95	1.00	2.000	Yes
253	41.50	2.31	0.98	1.33	0.84	0.531	1.15	0.462	0.95	1.00	2.000	Yes
254	41.67	2.32	0.99	1.33	0.84	0.530	1.15	0.461	0.95	1.00	2.000	Yes
255	41.83	2.33	0.99	1.33	0.83	0.530	1.15	0.461	0.95	1.00	2.000	Yes
256	42.00	2.34	1.00	1.34	0.83	0.529	1.15	0.460	0.95	1.00	2.000	Yes
257	42.16	2.35	1.00	1.34	0.83	0.529	1.15	0.460	0.95	1.00	2.000	Yes
258	42.32	2.35	1.01	1.35	0.83	0.528	1.15	0.459	0.95	1.00	2.000	Yes
259	42.49	2.36	1.01	1.35	0.83	0.528	1.15	0.459	0.95	1.00	0.485	No
260	42.65	2.37	1.02	1.35	0.83	0.527	1.15	0.458	0.94	1.00	0.485	No
261	42.82	2.38	1.02	1.36	0.83	0.527	1.15	0.458	0.94	1.00	0.485	No
262	42.98	2.39	1.03	1.36	0.82	0.526	1.15	0.457	0.94	1.00	0.485	No
263	43.14	2.40	1.03	1.37	0.82	0.526	1.15	0.457	0.94	1.00	0.485	No
264	43.31	2.41	1.04	1.37	0.82	0.525	1.15	0.457	0.94	1.00	0.484	No
265	43.47	2.42	1.04	1.37	0.82	0.525	1.15	0.456	0.94	1.00	0.484	No
266	43.64	2.43	1.05	1.38	0.82	0.524	1.15	0.456	0.94	1.00	0.484	No
267	43.80	2.44	1.05	1.38	0.82	0.523	1.15	0.455	0.94	1.00	0.484	No
268	43.96	2.45	1.06	1.39	0.81	0.523	1.15	0.454	0.94	1.00	0.484	No
269	44.13	2.46	1.06	1.39	0.81	0.522	1.15	0.454	0.94	1.00	0.483	No
270	44.29	2.47	1.07	1.40	0.81	0.521	1.15	0.453	0.94	1.00	0.483	No
271	44.46	2.48	1.07	1.40	0.81	0.520	1.15	0.452	0.94	1.00	0.483	No
272	44.62	2.49	1.08	1.41	0.81	0.520	1.15	0.452	0.94	1.00	0.482	No
273	44.78	2.50	1.09	1.41	0.81	0.519	1.15	0.451	0.94	1.00	0.482	No
274	44.95	2.51	1.09	1.42	0.80	0.518	1.15	0.451	0.94	1.00	0.482	No
275	45.11	2.52	1.10	1.42	0.80	0.518	1.15	0.450	0.93	1.00	0.481	No
276	45.28	2.52	1.10	1.42	0.80	0.517	1.15	0.449	0.93	1.00	0.481	No
277	45.44	2.53	1.11	1.43	0.80	0.516	1.15	0.449	0.93	1.00	0.481	No
278	45.60	2.54	1.11	1.43	0.80	0.515	1.15	0.448	0.93	1.00	0.480	No
279	45.77	2.55	1.12	1.44	0.80	0.515	1.15	0.448	0.93	1.00	2.000	Yes
280	45.93	2.56	1.12	1.44	0.79	0.514	1.15	0.447	0.93	1.00	2.000	Yes
281	46.10	2.57	1.13	1.44	0.79	0.513	1.15	0.446	0.93	1.00	2.000	Yes
282	46.26	2.58	1.13	1.45	0.79	0.513	1.15	0.446	0.93	1.00	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1	0.16	735.34	1.23	0.84	0.50	1181.42	1.00	1181.42	4.000	No	No	2.00
2	0.33	636.45	1.19	0.72	0.50	1022.51	1.00	1022.51	4.000	No	No	2.00
3	0.49	498.28	1.15	0.58	0.50	800.51	1.00	800.51	4.000	No	No	2.00
4	0.66	361.66	1.20	0.54	0.50	580.98	1.00	580.98	4.000	No	No	2.00
5	0.82	290.88	1.35	0.69	0.50	467.25	1.00	467.25	4.000	No	No	2.00
6	0.98	217.65	1.57	1.04	0.50	349.57	1.00	349.57	4.000	No	No	2.00
7	1.15	132.83	1.85	1.65	0.57	213.29	1.15	245.06	4.000	Yes	No	2.00
8	1.31	68.11	2.25	3.05	0.72	109.29	1.79	195.20	4.000	Yes	No	2.00
9	1.48	50.78	2.40	3.80	0.78	81.44	2.32	188.60	4.000	Yes	No	2.00
10	1.64	49.00	2.42	3.85	0.79	78.55	2.38	186.69	4.000	No	No	2.00
11	1.80	50.03	2.38	3.54	0.78	80.19	2.24	179.94	4.000	No	No	2.00
12	1.97	49.17	2.36	3.29	0.77	78.80	2.17	171.13	4.000	No	No	2.00
13	2.13	52.42	2.25	2.46	0.73	84.00	1.81	151.66	4.000	No	No	2.00
14	2.30	53.47	2.19	2.08	0.70	85.67	1.65	141.66	4.000	No	No	2.00
15	2.46	55.31	2.13	1.72	0.68	88.61	1.50	133.24	4.000	No	No	2.00
16	2.63	58.46	2.06	1.46	0.65	93.65	1.39	129.93	4.000	No	No	2.00
17	2.79	62.42	1.98	1.20	0.62	100.00	1.28	127.73	4.000	No	No	2.00
18	2.95	65.10	1.92	1.03	0.60	104.29	1.21	126.45	4.000	No	No	2.00
19	3.12	68.67	1.90	1.02	0.59	110.02	1.19	131.11	4.000	No	No	2.00
20	3.28	67.32	1.93	1.10	0.60	107.82	1.22	131.66	4.000	Yes	No	2.00
21	3.45	57.18	2.03	1.29	0.64	91.52	1.34	122.96	4.000	Yes	No	2.00
22	3.61	41.67	2.19	1.56	0.70	66.59	1.64	109.25	4.000	Yes	No	2.00
23	3.77	31.63	2.29	1.61	0.74	50.44	1.92	96.92	4.000	Yes	No	2.00
24	3.94	23.00	2.43	1.77	0.79	36.57	2.42	88.65	4.000	Yes	No	2.00
25	4.10	16.73	2.58	2.10	0.85	26.48	3.23	85.42	4.000	Yes	No	2.00
26	4.27	11.91	2.73	2.36	0.91	18.72	4.25	79.60	4.000	Yes	Yes	2.00
27	4.43	10.72	2.69	1.66	0.89	16.80	3.90	65.49	4.000	No	Yes	2.00
28	4.59	8.88	2.65	1.02	0.88	13.82	3.67	50.77	4.000	No	Yes	2.00
29	4.76	6.80	2.65	0.53	0.88	10.47	3.62	37.85	4.000	No	Yes	2.00
30	4.92	5.21	2.77	0.56	0.92	7.91	4.52	35.72	4.000	No	Yes	2.00
31	5.09	5.30	2.76	0.55	0.92	8.03	4.45	35.73	4.000	No	Yes	2.00
32	5.25	5.44	2.78	0.66	0.93	8.25	4.59	37.90	4.000	No	Yes	2.00
33	5.41	5.56	2.82	0.88	0.94	8.43	4.93	41.56	4.000	No	Yes	2.00
34	5.58	5.83	2.82	1.01	0.94	8.84	5.00	44.19	4.000	No	Yes	2.00
35	5.74	6.07	2.79	0.93	0.93	9.22	4.72	43.55	4.000	No	Yes	2.00
36	5.91	6.19	2.76	0.80	0.92	9.41	4.44	41.80	4.000	No	Yes	2.00
37	6.07	5.97	2.74	0.66	0.91	9.04	4.30	38.87	4.000	No	Yes	2.00
38	6.23	5.60	2.73	0.50	0.91	8.43	4.18	35.27	4.000	No	Yes	2.00
39	6.40	5.26	2.76	0.51	0.92	7.87	4.42	34.76	4.000	No	Yes	2.00
40	6.56	5.00	2.93	1.23	0.98	7.45	5.99	44.63	4.000	No	Yes	2.00
41	6.73	6.22	2.95	2.03	0.99	9.40	6.18	58.07	4.000	No	Yes	2.00
42	6.89	7.85	2.92	2.64	0.98	11.99	5.90	70.82	4.000	No	Yes	2.00
43	7.05	9.61	2.86	2.85	0.96	14.81	5.36	79.42	4.000	No	Yes	2.00
44	7.22	10.16	2.88	3.24	0.96	15.68	5.49	86.02	4.000	No	Yes	2.00
45	7.38	10.43	2.89	3.55	0.97	16.10	5.64	90.72	4.000	No	Yes	2.00
46	7.55	10.64	2.91	3.82	0.97	16.43	5.76	94.61	4.000	No	Yes	2.00
47	7.71	10.88	2.90	3.83	0.97	16.79	5.70	95.64	4.000	No	Yes	2.00
48	7.87	10.92	2.88	3.62	0.97	16.84	5.53	93.18	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
49	8.04	10.82	2.85	3.15	0.95	16.67	5.22	86.97	4.000	No	Yes	2.00
50	8.20	10.97	2.80	2.68	0.94	16.90	4.81	81.30	4.000	No	Yes	2.00
51	8.37	11.48	2.75	2.34	0.92	17.70	4.39	77.65	4.000	No	Yes	2.00
52	8.53	12.32	2.70	2.10	0.90	19.03	3.99	75.97	4.000	No	Yes	2.00
53	8.69	12.01	2.71	2.11	0.90	18.53	4.07	75.31	4.000	No	Yes	2.00
54	8.86	11.11	2.76	2.31	0.92	17.07	4.47	76.25	4.000	No	Yes	2.00
55	9.02	10.69	2.80	2.53	0.93	16.37	4.77	78.16	4.000	No	Yes	2.00
56	9.19	11.53	2.76	2.44	0.92	17.72	4.47	79.18	4.000	No	Yes	2.00
57	9.35	12.25	2.71	2.17	0.90	18.86	4.07	76.80	4.000	No	Yes	2.00
58	9.51	11.45	2.73	2.10	0.91	17.55	4.21	73.83	4.000	No	Yes	2.00
59	9.68	9.85	2.80	2.22	0.93	14.98	4.77	71.43	4.000	No	Yes	2.00
60	9.84	9.27	2.84	2.40	0.95	14.02	5.15	72.14	4.000	No	Yes	2.00
61	10.01	10.51	2.80	2.46	0.93	16.01	4.79	76.64	4.000	No	Yes	2.00
62	10.17	12.67	2.75	2.62	0.91	19.47	4.36	84.82	4.000	No	Yes	2.00
63	10.34	15.18	2.70	2.83	0.90	23.47	4.02	94.43	4.000	No	Yes	2.00
64	10.50	16.52	2.70	3.05	0.89	25.61	3.96	101.43	4.000	No	Yes	2.00
65	10.66	17.21	2.69	3.14	0.89	26.71	3.92	104.63	4.000	No	Yes	2.00
66	10.83	17.06	2.68	3.02	0.89	26.45	3.86	102.08	4.000	No	Yes	2.00
67	10.99	16.66	2.67	2.84	0.89	25.80	3.80	98.09	4.000	No	Yes	2.00
68	11.16	16.50	2.66	2.66	0.88	25.52	3.70	94.53	4.000	No	Yes	2.00
69	11.32	16.81	2.67	2.88	0.89	26.01	3.81	99.07	4.000	No	Yes	2.00
70	11.48	17.15	2.69	3.17	0.89	26.52	3.95	104.79	4.000	No	Yes	2.00
71	11.65	18.03	2.69	3.25	0.89	27.70	3.90	107.97	4.000	No	Yes	2.00
72	11.81	18.02	2.67	3.05	0.89	27.42	3.80	104.07	4.000	No	Yes	2.00
73	11.98	17.99	2.65	2.73	0.88	27.05	3.62	97.96	4.000	No	Yes	2.00
74	12.14	16.79	2.67	2.68	0.88	25.11	3.76	94.36	4.000	No	Yes	2.00
75	12.30	16.33	2.69	2.85	0.89	24.37	3.94	96.08	4.000	No	Yes	2.00
76	12.47	16.32	2.71	3.04	0.90	24.30	4.08	99.12	4.000	No	Yes	2.00
77	12.63	16.52	2.71	3.04	0.90	24.45	4.06	99.36	4.000	No	Yes	2.00
78	12.80	16.16	2.71	2.96	0.90	23.74	4.08	96.91	4.000	No	Yes	2.00
79	12.96	15.65	2.72	2.90	0.90	22.85	4.14	94.58	4.000	No	Yes	2.00
80	13.12	14.88	2.74	2.98	0.91	21.64	4.34	93.83	4.000	No	Yes	2.00
81	13.29	14.01	2.77	3.01	0.92	20.28	4.53	91.96	4.000	No	Yes	2.00
82	13.45	13.07	2.79	2.91	0.93	18.80	4.67	87.86	4.000	No	Yes	2.00
83	13.62	12.82	2.77	2.66	0.92	18.25	4.56	83.31	4.000	No	Yes	2.00
84	13.78	13.36	2.74	2.42	0.91	18.83	4.29	80.69	4.000	No	Yes	2.00
85	13.94	14.13	2.71	2.34	0.90	19.77	4.09	80.82	4.000	No	Yes	2.00
86	14.11	15.28	2.69	2.41	0.89	21.26	3.96	84.18	4.000	No	Yes	2.00
87	14.27	17.31	2.66	2.44	0.88	23.93	3.70	88.55	4.000	No	Yes	2.00
88	14.44	19.35	2.63	2.53	0.87	26.59	3.52	93.64	4.000	No	Yes	2.00
89	14.60	20.34	2.61	2.50	0.86	27.76	3.41	94.69	4.000	No	Yes	2.00
90	14.76	19.74	2.63	2.52	0.87	26.81	3.49	93.69	4.000	No	Yes	2.00
91	14.93	19.20	2.62	2.31	0.86	25.85	3.43	88.59	4.000	No	Yes	2.00
92	15.09	19.72	2.59	2.12	0.85	26.31	3.25	85.62	0.138	No	No	0.37
93	15.26	21.16	2.55	1.99	0.84	27.96	3.04	84.91	0.137	No	No	0.36
94	15.42	22.91	2.54	2.11	0.84	30.16	2.98	89.80	0.147	No	No	0.39
95	15.58	24.70	2.53	2.19	0.83	32.35	2.90	93.77	0.157	No	No	0.41
96	15.75	25.40	2.53	2.30	0.83	33.15	2.93	96.99	0.165	No	No	0.43

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
97	15.91	25.28	2.54	2.33	0.83	32.85	2.96	97.23	0.165	No	No	0.43
98	16.08	24.34	2.56	2.41	0.84	31.52	3.09	97.40	0.166	No	No	0.43
99	16.24	23.92	2.57	2.42	0.85	30.82	3.14	96.85	0.164	No	No	0.42
100	16.40	24.71	2.55	2.32	0.84	31.62	3.03	95.74	0.162	No	No	0.41
101	16.57	25.57	2.55	2.42	0.84	32.59	3.04	98.95	0.170	No	No	0.43
102	16.73	26.00	2.57	2.67	0.85	33.09	3.16	104.61	0.186	No	No	0.47
103	16.90	24.92	2.62	3.03	0.87	31.71	3.46	109.83	4.000	No	Yes	2.00
104	17.06	23.55	2.65	3.09	0.88	29.85	3.63	108.41	4.000	No	Yes	2.00
105	17.22	22.19	2.66	3.03	0.88	27.96	3.74	104.48	4.000	No	Yes	2.00
106	17.39	20.94	2.68	3.00	0.89	26.23	3.87	101.50	4.000	No	Yes	2.00
107	17.55	19.07	2.73	3.11	0.91	23.79	4.18	99.50	4.000	No	Yes	2.00
108	17.72	16.73	2.78	3.24	0.93	20.75	4.64	96.20	4.000	No	Yes	2.00
109	17.88	14.86	2.85	3.63	0.96	18.36	5.26	96.66	4.000	No	Yes	2.00
110	18.05	16.33	2.80	3.34	0.94	20.05	4.80	96.32	4.000	No	Yes	2.00
111	18.21	18.82	2.73	3.08	0.91	22.97	4.25	97.63	4.000	No	Yes	2.00
112	18.37	21.60	2.64	2.59	0.87	26.11	3.60	94.09	4.000	No	Yes	2.00
113	18.54	21.81	2.66	2.81	0.88	26.30	3.74	98.32	4.000	No	Yes	2.00
114	18.70	24.63	2.64	3.02	0.87	29.63	3.60	106.72	4.000	No	Yes	2.00
115	18.87	27.77	2.61	3.08	0.86	33.26	3.40	112.97	4.000	No	Yes	2.00
116	19.03	28.14	2.60	2.98	0.86	33.50	3.33	111.41	0.209	No	No	0.50
117	19.19	24.66	2.64	2.92	0.87	29.17	3.58	104.40	4.000	No	Yes	2.00
118	19.36	21.12	2.68	2.75	0.89	24.78	3.83	95.02	4.000	No	Yes	2.00
119	19.52	21.74	2.62	2.31	0.87	25.27	3.48	87.87	4.000	No	Yes	2.00
120	19.69	23.41	2.57	2.04	0.85	27.01	3.14	84.84	0.137	No	No	0.33
121	19.85	23.60	2.59	2.22	0.85	27.17	3.26	88.60	0.145	No	No	0.34
122	20.01	21.91	2.66	2.59	0.88	25.18	3.69	92.88	4.000	No	Yes	2.00
123	20.18	19.78	2.71	2.80	0.90	22.62	4.10	92.71	4.000	No	Yes	2.00
124	20.34	19.08	2.71	2.63	0.90	21.66	4.08	88.34	4.000	No	Yes	2.00
125	20.51	18.74	2.70	2.43	0.90	21.12	3.99	84.27	4.000	No	Yes	2.00
126	20.67	18.75	2.69	2.33	0.89	21.02	3.93	82.54	4.000	No	Yes	2.00
127	20.83	18.23	2.72	2.46	0.90	20.34	4.11	83.71	4.000	No	Yes	2.00
128	21.00	18.29	2.74	2.70	0.91	20.35	4.30	87.48	4.000	No	Yes	2.00
129	21.16	18.64	2.75	2.88	0.92	20.70	4.39	90.81	4.000	No	Yes	2.00
130	21.33	19.44	2.74	2.95	0.91	21.51	4.33	93.19	4.000	No	Yes	2.00
131	21.49	20.19	2.73	2.92	0.91	22.26	4.22	93.90	4.000	No	Yes	2.00
132	21.65	20.89	2.72	2.96	0.91	22.94	4.17	95.71	4.000	No	Yes	2.00
133	21.82	21.15	2.73	3.07	0.91	23.15	4.22	97.72	4.000	No	Yes	2.00
134	21.98	23.33	2.69	2.97	0.89	25.46	3.92	99.88	4.000	No	Yes	2.00
135	22.15	26.82	2.67	3.32	0.89	29.29	3.81	111.60	4.000	No	Yes	2.00
136	22.31	42.34	2.50	3.03	0.82	46.17	2.77	128.12	0.276	No	No	0.63
137	22.47	51.38	2.47	3.34	0.81	55.91	2.63	146.85	0.375	No	No	0.86
138	22.64	54.30	2.46	3.43	0.81	58.85	2.59	152.42	0.409	No	No	0.94
139	22.80	40.10	2.59	3.86	0.86	43.30	3.29	142.38	0.348	No	No	0.80
140	22.97	28.08	2.70	3.76	0.90	29.98	4.02	120.40	4.000	No	Yes	2.00
141	23.13	19.74	2.78	3.19	0.93	20.66	4.61	95.31	4.000	No	Yes	2.00
142	23.29	16.16	2.81	2.64	0.94	16.60	4.83	80.21	4.000	No	Yes	2.00
143	23.46	14.14	2.82	2.28	0.94	14.30	4.97	71.00	4.000	No	Yes	2.00
144	23.62	12.59	2.84	2.00	0.95	12.53	5.12	64.13	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
145	23.79	11.12	2.86	1.76	0.96	10.86	5.33	57.90	4.000	No	Yes	2.00
146	23.95	10.61	2.87	1.69	0.96	10.26	5.44	55.82	4.000	No	Yes	2.00
147	24.11	13.40	2.79	1.74	0.93	13.21	4.67	61.70	4.000	No	Yes	2.00
148	24.28	17.63	2.71	1.96	0.90	17.69	4.05	71.73	4.000	No	Yes	2.00
149	24.44	19.86	2.68	2.11	0.89	19.99	3.88	77.47	4.000	No	Yes	2.00
150	24.61	19.11	2.72	2.29	0.90	19.13	4.13	79.06	4.000	No	Yes	2.00
151	24.77	16.85	2.78	2.40	0.93	16.68	4.61	76.86	4.000	No	Yes	2.00
152	24.93	16.33	2.79	2.34	0.93	16.06	4.67	75.04	4.000	No	Yes	2.00
153	25.10	15.79	2.81	2.44	0.94	15.42	4.88	75.26	4.000	No	Yes	2.00
154	25.26	15.17	2.83	2.45	0.95	14.70	5.04	74.07	4.000	No	Yes	2.00
155	25.43	13.98	2.85	2.36	0.95	13.39	5.26	70.41	4.000	No	Yes	2.00
156	25.59	12.78	2.86	2.04	0.96	12.06	5.29	63.79	4.000	No	Yes	2.00
157	25.76	11.97	2.88	1.96	0.96	11.16	5.46	60.95	4.000	No	Yes	2.00
158	25.92	11.51	2.91	2.08	0.98	10.64	5.77	61.38	4.000	No	Yes	2.00
159	26.08	10.99	2.95	2.26	0.99	10.06	6.16	62.03	4.000	No	Yes	2.00
160	26.25	10.59	2.95	2.15	0.99	9.60	6.23	59.77	4.000	No	Yes	2.00
161	26.41	10.46	2.95	2.09	0.99	9.42	6.23	58.73	4.000	No	Yes	2.00
162	26.58	10.90	2.93	2.01	0.98	9.83	5.98	58.72	4.000	No	Yes	2.00
163	26.74	11.27	2.93	2.11	0.98	10.17	5.96	60.64	4.000	No	Yes	2.00
164	26.90	11.98	2.91	2.21	0.98	10.86	5.83	63.33	4.000	No	Yes	2.00
165	27.07	12.96	2.91	2.50	0.98	11.81	5.82	68.76	4.000	No	Yes	2.00
166	27.23	14.60	2.88	2.67	0.97	13.43	5.53	74.32	4.000	No	Yes	2.00
167	27.40	16.40	2.86	2.88	0.96	15.19	5.31	80.62	4.000	No	Yes	2.00
168	27.56	17.98	2.83	2.95	0.95	16.72	5.05	84.51	4.000	No	Yes	2.00
169	27.72	18.93	2.82	2.97	0.94	17.59	4.92	86.53	4.000	No	Yes	2.00
170	27.89	19.15	2.80	2.87	0.94	17.74	4.82	85.43	4.000	No	Yes	2.00
171	28.05	18.62	2.81	2.80	0.94	17.13	4.87	83.37	4.000	No	Yes	2.00
172	28.22	18.08	2.82	2.77	0.94	16.52	4.95	81.71	4.000	No	Yes	2.00
173	28.38	17.07	2.84	2.70	0.95	15.45	5.10	78.80	4.000	No	Yes	2.00
174	28.54	16.22	2.84	2.53	0.95	14.54	5.14	74.76	4.000	No	Yes	2.00
175	28.71	15.25	2.84	2.30	0.95	13.52	5.17	69.83	4.000	No	Yes	2.00
176	28.87	14.72	2.85	2.24	0.95	12.95	5.25	67.98	4.000	No	Yes	2.00
177	29.04	14.43	2.87	2.34	0.96	12.61	5.44	68.55	4.000	No	Yes	2.00
178	29.20	14.38	2.89	2.48	0.97	12.50	5.60	70.04	4.000	No	Yes	2.00
179	29.36	15.20	2.87	2.47	0.96	13.25	5.40	71.52	4.000	No	Yes	2.00
180	29.53	16.62	2.83	2.45	0.95	14.57	5.06	73.77	4.000	No	Yes	2.00
181	29.69	18.52	2.80	2.52	0.93	16.34	4.77	77.95	4.000	No	Yes	2.00
182	29.86	19.83	2.79	2.63	0.93	17.53	4.66	81.73	4.000	No	Yes	2.00
183	30.02	20.87	2.79	2.84	0.93	18.46	4.68	86.37	4.000	No	Yes	2.00
184	30.18	22.76	2.77	2.95	0.92	20.19	4.51	91.01	4.000	No	Yes	2.00
185	30.35	25.42	2.72	2.91	0.91	22.63	4.18	94.48	4.000	No	Yes	2.00
186	30.51	27.45	2.70	2.89	0.89	24.46	3.97	97.01	4.000	No	Yes	2.00
187	30.68	30.48	2.67	2.95	0.88	27.23	3.75	102.14	4.000	No	Yes	2.00
188	30.84	30.30	2.66	2.87	0.88	26.95	3.72	100.28	4.000	No	Yes	2.00
189	31.00	27.42	2.69	2.81	0.89	24.14	3.94	95.12	4.000	No	Yes	2.00
190	31.17	22.13	2.74	2.49	0.91	19.09	4.30	82.13	4.000	No	Yes	2.00
191	31.33	18.90	2.79	2.35	0.93	16.00	4.69	74.95	4.000	No	Yes	2.00
192	31.50	18.30	2.77	2.04	0.92	15.39	4.52	69.56	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
193	31.66	17.64	2.78	1.99	0.93	14.71	4.61	67.74	4.000	No	Yes	2.00
194	31.82	18.28	2.79	2.19	0.93	15.24	4.69	71.49	4.000	No	Yes	2.00
195	31.99	20.98	2.75	2.30	0.91	17.68	4.36	77.11	4.000	No	Yes	2.00
196	32.15	23.33	2.72	2.38	0.90	19.77	4.13	81.56	4.000	No	Yes	2.00
197	32.32	25.84	2.65	2.15	0.88	22.00	3.68	80.87	4.000	No	Yes	2.00
198	32.48	24.45	2.68	2.22	0.89	20.65	3.88	80.15	4.000	No	Yes	2.00
199	32.64	27.37	2.60	1.86	0.86	23.26	3.31	77.02	0.122	No	No	0.26
200	32.81	26.84	2.62	1.98	0.87	22.68	3.47	78.63	4.000	No	Yes	2.00
201	32.97	25.82	2.64	1.98	0.87	21.67	3.57	77.27	4.000	No	Yes	2.00
202	33.14	21.22	2.73	2.11	0.91	17.41	4.24	73.79	4.000	No	Yes	2.00
203	33.30	18.06	2.79	2.03	0.93	14.51	4.68	67.88	4.000	No	Yes	2.00
204	33.47	17.91	2.76	1.77	0.92	14.33	4.46	63.91	4.000	No	Yes	2.00
205	33.63	17.52	2.79	1.95	0.93	13.92	4.73	65.81	4.000	No	Yes	2.00
206	33.79	18.32	2.79	2.03	0.93	14.58	4.67	68.14	4.000	No	Yes	2.00
207	33.96	19.37	2.79	2.22	0.93	15.45	4.68	72.22	4.000	No	Yes	2.00
208	34.12	22.50	2.74	2.31	0.91	18.17	4.29	78.01	4.000	No	Yes	2.00
209	34.28	24.76	2.73	2.51	0.91	20.10	4.19	84.11	4.000	No	Yes	2.00
210	34.45	25.17	2.74	2.73	0.91	20.37	4.32	88.01	4.000	No	Yes	2.00
211	34.61	22.62	2.80	2.87	0.93	18.03	4.76	85.90	4.000	No	Yes	2.00
212	34.78	20.18	2.83	2.78	0.95	15.83	5.09	80.52	4.000	No	Yes	2.00
213	34.94	18.65	2.84	2.51	0.95	14.44	5.15	74.41	4.000	No	Yes	2.00
214	35.11	17.70	2.85	2.40	0.95	13.56	5.25	71.18	4.000	No	Yes	2.00
215	35.27	17.42	2.85	2.31	0.95	13.27	5.24	69.53	4.000	No	Yes	2.00
216	35.43	18.36	2.83	2.28	0.95	14.04	5.03	70.63	4.000	No	Yes	2.00
217	35.60	20.35	2.78	2.24	0.93	15.71	4.65	73.02	4.000	No	Yes	2.00
218	35.76	22.73	2.72	2.09	0.91	17.73	4.17	73.95	4.000	No	Yes	2.00
219	35.93	24.35	2.68	1.95	0.89	19.08	3.85	73.50	4.000	No	Yes	2.00
220	36.09	24.12	2.69	1.97	0.89	18.82	3.90	73.39	4.000	No	Yes	2.00
221	36.25	23.24	2.72	2.07	0.90	17.99	4.11	73.88	4.000	No	Yes	2.00
222	36.42	22.63	2.74	2.17	0.91	17.39	4.29	74.65	4.000	No	Yes	2.00
223	36.58	23.42	2.72	2.09	0.90	18.01	4.12	74.20	4.000	No	Yes	2.00
224	36.75	23.23	2.71	2.02	0.90	17.79	4.09	72.83	4.000	No	Yes	2.00
225	36.91	22.42	2.70	1.82	0.90	17.06	4.02	68.64	4.000	No	Yes	2.00
226	37.07	20.32	2.72	1.67	0.91	15.24	4.18	63.63	4.000	No	Yes	2.00
227	37.24	18.91	2.80	2.03	0.94	13.95	4.80	67.03	4.000	No	Yes	2.00
228	37.40	22.39	2.82	2.85	0.94	16.75	4.97	83.22	4.000	No	Yes	2.00
229	37.57	28.53	2.76	3.21	0.92	21.81	4.48	97.72	4.000	No	Yes	2.00
230	37.73	30.28	2.76	3.42	0.92	23.17	4.46	103.23	4.000	No	Yes	2.00
231	37.89	26.43	2.78	3.10	0.93	19.90	4.65	92.60	4.000	No	Yes	2.00
232	38.06	19.82	2.86	2.74	0.96	14.37	5.36	77.09	4.000	No	Yes	2.00
233	38.22	17.03	2.83	1.82	0.95	12.09	5.03	60.85	4.000	No	Yes	2.00
234	38.39	15.56	2.85	1.65	0.95	10.85	5.20	56.45	4.000	No	Yes	2.00
235	38.55	15.77	2.85	1.68	0.95	10.98	5.19	57.02	4.000	No	Yes	2.00
236	38.71	17.24	2.82	1.79	0.94	12.15	4.99	60.57	4.000	No	Yes	2.00
237	38.88	18.93	2.80	1.89	0.93	13.48	4.77	64.25	4.000	No	Yes	2.00
238	39.04	20.62	2.76	1.86	0.92	14.83	4.45	65.94	4.000	No	Yes	2.00
239	39.21	22.16	2.74	1.94	0.91	16.03	4.30	68.96	4.000	No	Yes	2.00
240	39.37	23.45	2.75	2.18	0.91	17.00	4.36	74.17	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
241	39.53	23.57	2.79	2.62	0.93	16.98	4.74	80.50	4.000	No	Yes	2.00
242	39.70	22.98	2.84	2.95	0.95	16.40	5.11	83.87	4.000	No	Yes	2.00
243	39.86	22.11	2.86	3.04	0.96	15.63	5.34	83.53	4.000	No	Yes	2.00
244	40.03	21.73	2.87	3.00	0.96	15.27	5.38	82.20	4.000	No	Yes	2.00
245	40.19	21.66	2.86	2.93	0.96	15.17	5.35	81.19	4.000	No	Yes	2.00
246	40.35	21.50	2.86	2.89	0.96	14.99	5.35	80.23	4.000	No	Yes	2.00
247	40.52	20.82	2.87	2.76	0.96	14.41	5.38	77.48	4.000	No	Yes	2.00
248	40.68	20.07	2.87	2.61	0.96	13.77	5.39	74.29	4.000	No	Yes	2.00
249	40.85	20.25	2.85	2.47	0.95	13.88	5.24	72.70	4.000	No	Yes	2.00
250	41.01	21.65	2.82	2.40	0.94	14.95	4.94	73.90	4.000	No	Yes	2.00
251	41.18	24.58	2.82	2.91	0.94	17.16	4.95	84.86	4.000	Yes	Yes	2.00
252	41.34	35.44	2.63	2.44	0.87	25.82	3.52	90.94	4.000	Yes	Yes	2.00
253	41.50	46.68	2.49	2.08	0.81	34.90	2.70	94.10	4.000	Yes	No	2.00
254	41.67	47.56	2.43	1.74	0.79	35.66	2.44	87.02	4.000	Yes	No	2.00
255	41.83	36.90	2.53	1.78	0.83	26.93	2.95	79.47	4.000	Yes	No	2.00
256	42.00	24.51	2.73	2.04	0.91	16.93	4.24	71.84	4.000	Yes	Yes	2.00
257	42.16	20.53	2.83	2.18	0.94	13.73	5.00	68.70	4.000	Yes	Yes	2.00
258	42.32	19.20	2.87	2.28	0.96	12.63	5.37	67.87	4.000	Yes	Yes	2.00
259	42.49	18.42	2.90	2.40	0.97	11.98	5.67	67.93	4.000	No	Yes	2.00
260	42.65	18.41	2.90	2.36	0.97	11.93	5.65	67.44	4.000	No	Yes	2.00
261	42.82	18.89	2.88	2.34	0.97	12.25	5.53	67.82	4.000	No	Yes	2.00
262	42.98	19.53	2.87	2.33	0.96	12.70	5.40	68.64	4.000	No	Yes	2.00
263	43.14	19.84	2.86	2.30	0.96	12.90	5.32	68.60	4.000	No	Yes	2.00
264	43.31	20.18	2.83	2.11	0.95	13.15	5.07	66.75	4.000	No	Yes	2.00
265	43.47	20.26	2.82	2.04	0.94	13.18	4.99	65.83	4.000	No	Yes	2.00
266	43.64	21.37	2.82	2.19	0.94	13.95	4.96	69.27	4.000	No	Yes	2.00
267	43.80	23.93	2.85	2.95	0.95	15.74	5.25	82.56	4.000	No	Yes	2.00
268	43.96	30.42	2.80	3.43	0.93	20.53	4.79	98.41	4.000	No	Yes	2.00
269	44.13	38.85	2.72	3.51	0.90	26.85	4.13	110.94	4.000	No	Yes	2.00
270	44.29	42.52	2.69	3.51	0.89	29.56	3.90	115.38	4.000	No	Yes	2.00
271	44.46	41.23	2.69	3.36	0.89	28.51	3.90	111.12	4.000	No	Yes	2.00
272	44.62	35.35	2.74	3.33	0.91	23.96	4.31	103.25	4.000	No	Yes	2.00
273	44.78	32.33	2.76	3.19	0.92	21.63	4.49	97.09	4.000	No	Yes	2.00
274	44.95	32.26	2.75	2.99	0.91	21.55	4.36	93.90	4.000	No	Yes	2.00
275	45.11	31.78	2.74	2.81	0.91	21.16	4.27	90.42	4.000	No	Yes	2.00
276	45.28	28.30	2.76	2.56	0.92	18.54	4.44	82.37	4.000	No	Yes	2.00
277	45.44	23.10	2.84	2.54	0.95	14.62	5.14	75.14	4.000	No	Yes	2.00
278	45.60	20.58	2.90	2.60	0.97	12.70	5.66	71.88	4.000	No	Yes	2.00
279	45.77	21.95	2.86	2.55	0.96	13.68	5.36	73.33	4.000	Yes	Yes	2.00
280	45.93	23.88	2.79	2.15	0.93	15.12	4.68	70.74	4.000	Yes	Yes	2.00
281	46.10	27.95	2.64	1.58	0.88	18.26	3.61	65.99	4.000	Yes	Yes	2.00
282	46.26	31.19	2.52	1.15	0.83	20.84	2.89	60.28	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
I_c: Soil behavior type index
Fr: Normalized friction ratio (%)
n: Stress exponent
Q_{tn}: Normalized cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cydic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.98	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.93	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.88	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.83	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.78	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.73	0.16	0.00	1.97	2.00	0.00	9.70	0.17	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.63	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.45	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.38	0.16	0.00	4.27	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.33	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.28	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.09	2.00	0.00	9.23	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.18	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.13	0.16	0.00	5.91	2.00	0.00	9.10	0.17	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.78	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.73	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.68	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.63	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.58	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.53	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	2.00	0.00	8.47	0.16	0.00	10.17	2.00	0.00	8.45	0.16	0.00
10.34	2.00	0.00	8.42	0.16	0.00	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.16	2.00	0.00	8.30	0.16	0.00
11.32	2.00	0.00	8.27	0.16	0.00	11.48	2.00	0.00	8.25	0.16	0.00
11.65	2.00	0.00	8.22	0.16	0.00	11.81	2.00	0.00	8.20	0.16	0.00
11.98	2.00	0.00	8.18	0.16	0.00	12.14	2.00	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.13	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.08	0.16	0.00	12.80	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.03	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.98	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.93	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	2.00	0.00	7.80	0.16	0.00
14.60	2.00	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	2.00	0.00	7.72	0.16	0.00	15.09	0.37	0.63	7.70	0.16	0.24
15.26	0.36	0.64	7.67	0.16	0.25	15.42	0.39	0.61	7.65	0.16	0.24
15.58	0.41	0.59	7.62	0.16	0.23	15.75	0.43	0.57	7.60	0.16	0.22

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	0.43	0.57	7.58	0.16	0.22	16.08	0.43	0.57	7.55	0.16	0.22
16.24	0.42	0.58	7.53	0.16	0.22	16.40	0.41	0.59	7.50	0.16	0.22
16.57	0.43	0.57	7.48	0.16	0.21	16.73	0.47	0.53	7.45	0.16	0.20
16.90	2.00	0.00	7.43	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.38	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.33	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.05	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.87	2.00	0.00	7.12	0.16	0.00	19.03	0.50	0.50	7.10	0.16	0.18
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.69	0.33	0.67	7.00	0.16	0.24
19.85	0.34	0.66	6.98	0.16	0.23	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.93	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.51	2.00	0.00	6.88	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.83	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	2.00	0.00	6.78	0.16	0.00	21.33	2.00	0.00	6.75	0.16	0.00
21.49	2.00	0.00	6.72	0.16	0.00	21.65	2.00	0.00	6.70	0.16	0.00
21.82	2.00	0.00	6.67	0.16	0.00	21.98	2.00	0.00	6.65	0.16	0.00
22.15	2.00	0.00	6.62	0.16	0.00	22.31	0.63	0.37	6.60	0.16	0.12
22.47	0.86	0.14	6.57	0.16	0.05	22.64	0.94	0.06	6.55	0.16	0.02
22.80	0.80	0.20	6.52	0.16	0.07	22.97	2.00	0.00	6.50	0.16	0.00
23.13	2.00	0.00	6.47	0.16	0.00	23.29	2.00	0.00	6.45	0.16	0.00
23.46	2.00	0.00	6.43	0.16	0.00	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.38	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.33	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.28	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.23	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.18	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.76	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.58	2.00	0.00	5.95	0.16	0.00
26.74	2.00	0.00	5.92	0.16	0.00	26.90	2.00	0.00	5.90	0.16	0.00
27.07	2.00	0.00	5.87	0.16	0.00	27.23	2.00	0.00	5.85	0.16	0.00
27.40	2.00	0.00	5.83	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.78	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.73	0.16	0.00	28.22	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.68	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.63	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.58	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.23	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.18	0.16	0.00	31.82	2.00	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.13	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.08	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	0.26	0.74	5.03	0.16	0.19	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.98	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.47	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	2.00	0.00	4.80	0.16	0.00
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.11	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.63	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.58	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.93	2.00	0.00	4.53	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.48	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.43	0.16	0.00	36.75	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.38	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00
39.21	2.00	0.00	4.03	0.16	0.00	39.37	2.00	0.00	4.00	0.16	0.00
39.53	2.00	0.00	3.98	0.16	0.00	39.70	2.00	0.00	3.95	0.16	0.00
39.86	2.00	0.00	3.93	0.16	0.00	40.03	2.00	0.00	3.90	0.16	0.00
40.19	2.00	0.00	3.88	0.16	0.00	40.35	2.00	0.00	3.85	0.16	0.00
40.52	2.00	0.00	3.83	0.16	0.00	40.68	2.00	0.00	3.80	0.16	0.00
40.85	2.00	0.00	3.78	0.16	0.00	41.01	2.00	0.00	3.75	0.17	0.00
41.18	2.00	0.00	3.72	0.16	0.00	41.34	2.00	0.00	3.70	0.16	0.00
41.50	2.00	0.00	3.67	0.16	0.00	41.67	2.00	0.00	3.65	0.16	0.00
41.83	2.00	0.00	3.62	0.16	0.00	42.00	2.00	0.00	3.60	0.16	0.00
42.16	2.00	0.00	3.57	0.16	0.00	42.32	2.00	0.00	3.55	0.16	0.00
42.49	2.00	0.00	3.52	0.16	0.00	42.65	2.00	0.00	3.50	0.16	0.00
42.82	2.00	0.00	3.47	0.16	0.00	42.98	2.00	0.00	3.45	0.16	0.00
43.14	2.00	0.00	3.43	0.16	0.00	43.31	2.00	0.00	3.40	0.16	0.00
43.47	2.00	0.00	3.38	0.16	0.00	43.64	2.00	0.00	3.35	0.16	0.00
43.80	2.00	0.00	3.33	0.16	0.00	43.96	2.00	0.00	3.30	0.16	0.00
44.13	2.00	0.00	3.28	0.16	0.00	44.29	2.00	0.00	3.25	0.16	0.00
44.46	2.00	0.00	3.23	0.16	0.00	44.62	2.00	0.00	3.20	0.16	0.00
44.78	2.00	0.00	3.18	0.16	0.00	44.95	2.00	0.00	3.15	0.16	0.00
45.11	2.00	0.00	3.12	0.16	0.00	45.28	2.00	0.00	3.10	0.16	0.00
45.44	2.00	0.00	3.07	0.16	0.00	45.60	2.00	0.00	3.05	0.16	0.00
45.77	2.00	0.00	3.02	0.16	0.00	45.93	2.00	0.00	3.00	0.16	0.00
46.10	2.00	0.00	2.97	0.16	0.00	46.26	2.00	0.00	2.95	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI

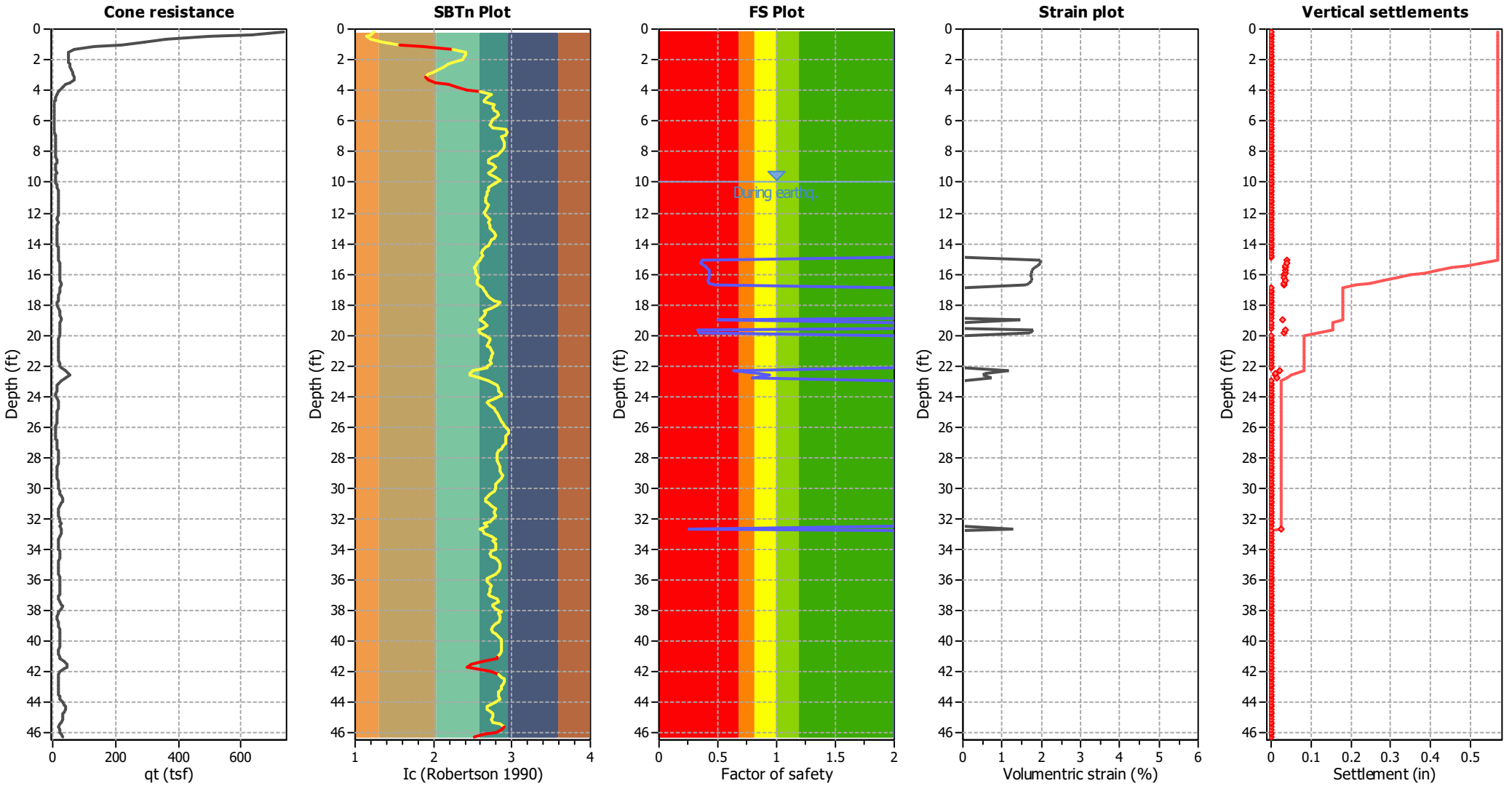
Overall liquefaction potential: 3.53

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
10.01	76.64	2.00	0.00	0.83	0.00	10.17	84.82	2.00	0.00	0.83	0.00
10.34	94.43	2.00	0.00	0.82	0.00	10.50	101.43	2.00	0.00	0.82	0.00
10.66	104.63	2.00	0.00	0.82	0.00	10.83	102.08	2.00	0.00	0.82	0.00
10.99	98.09	2.00	0.00	0.81	0.00	11.16	94.53	2.00	0.00	0.81	0.00
11.32	99.07	2.00	0.00	0.81	0.00	11.48	104.79	2.00	0.00	0.81	0.00
11.65	107.97	2.00	0.00	0.80	0.00	11.81	104.07	2.00	0.00	0.80	0.00
11.98	97.96	2.00	0.00	0.80	0.00	12.14	94.36	2.00	0.00	0.79	0.00
12.30	96.08	2.00	0.00	0.79	0.00	12.47	99.12	2.00	0.00	0.79	0.00
12.63	99.36	2.00	0.00	0.79	0.00	12.80	96.91	2.00	0.00	0.78	0.00
12.96	94.58	2.00	0.00	0.78	0.00	13.12	93.83	2.00	0.00	0.78	0.00
13.29	91.96	2.00	0.00	0.77	0.00	13.45	87.86	2.00	0.00	0.77	0.00
13.62	83.31	2.00	0.00	0.77	0.00	13.78	80.69	2.00	0.00	0.77	0.00
13.94	80.82	2.00	0.00	0.76	0.00	14.11	84.18	2.00	0.00	0.76	0.00
14.27	88.55	2.00	0.00	0.76	0.00	14.44	93.64	2.00	0.00	0.76	0.00
14.60	94.69	2.00	0.00	0.75	0.00	14.76	93.69	2.00	0.00	0.75	0.00
14.93	88.59	2.00	0.00	0.75	0.00	15.09	85.62	0.37	1.98	0.74	0.04
15.26	84.91	0.36	1.98	0.74	0.04	15.42	89.80	0.39	1.89	0.74	0.04
15.58	93.77	0.41	1.81	0.74	0.04	15.75	96.99	0.43	1.76	0.73	0.03
15.91	97.23	0.43	1.75	0.73	0.03	16.08	97.40	0.43	1.74	0.73	0.03
16.24	96.85	0.42	1.74	0.72	0.03	16.40	95.74	0.41	1.75	0.72	0.03
16.57	98.95	0.43	1.70	0.72	0.03	16.73	104.61	0.47	1.61	0.72	0.03
16.90	109.83	2.00	0.00	0.71	0.00	17.06	108.41	2.00	0.00	0.71	0.00
17.22	104.48	2.00	0.00	0.71	0.00	17.39	101.50	2.00	0.00	0.71	0.00
17.55	99.50	2.00	0.00	0.70	0.00	17.72	96.20	2.00	0.00	0.70	0.00
17.88	96.66	2.00	0.00	0.70	0.00	18.05	96.32	2.00	0.00	0.69	0.00
18.21	97.63	2.00	0.00	0.69	0.00	18.37	94.09	2.00	0.00	0.69	0.00
18.54	98.32	2.00	0.00	0.69	0.00	18.70	106.72	2.00	0.00	0.68	0.00
18.87	112.97	2.00	0.00	0.68	0.00	19.03	111.41	0.50	1.45	0.68	0.03
19.19	104.40	2.00	0.00	0.67	0.00	19.36	95.02	2.00	0.00	0.67	0.00
19.52	87.87	2.00	0.00	0.67	0.00	19.69	84.84	0.33	1.78	0.67	0.04
19.85	88.60	0.34	1.71	0.66	0.03	20.01	92.88	2.00	0.00	0.66	0.00
20.18	92.71	2.00	0.00	0.66	0.00	20.34	88.34	2.00	0.00	0.66	0.00
20.51	84.27	2.00	0.00	0.65	0.00	20.67	82.54	2.00	0.00	0.65	0.00
20.83	83.71	2.00	0.00	0.65	0.00	21.00	87.48	2.00	0.00	0.64	0.00
21.16	90.81	2.00	0.00	0.64	0.00	21.33	93.19	2.00	0.00	0.64	0.00
21.49	93.90	2.00	0.00	0.64	0.00	21.65	95.71	2.00	0.00	0.63	0.00
21.82	97.72	2.00	0.00	0.63	0.00	21.98	99.88	2.00	0.00	0.63	0.00
22.15	111.60	2.00	0.00	0.62	0.00	22.31	128.12	0.63	1.19	0.62	0.02
22.47	146.85	0.86	0.55	0.62	0.01	22.64	152.42	0.94	0.52	0.62	0.01
22.80	142.38	0.80	0.74	0.61	0.01	22.97	120.40	2.00	0.00	0.61	0.00
23.13	95.31	2.00	0.00	0.61	0.00	23.29	80.21	2.00	0.00	0.61	0.00
23.46	71.00	2.00	0.00	0.60	0.00	23.62	64.13	2.00	0.00	0.60	0.00
23.79	57.90	2.00	0.00	0.60	0.00	23.95	55.82	2.00	0.00	0.59	0.00
24.11	61.70	2.00	0.00	0.59	0.00	24.28	71.73	2.00	0.00	0.59	0.00
24.44	77.47	2.00	0.00	0.59	0.00	24.61	79.06	2.00	0.00	0.58	0.00
24.77	76.86	2.00	0.00	0.58	0.00	24.93	75.04	2.00	0.00	0.58	0.00
25.10	75.26	2.00	0.00	0.57	0.00	25.26	74.07	2.00	0.00	0.57	0.00
25.43	70.41	2.00	0.00	0.57	0.00	25.59	63.79	2.00	0.00	0.57	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
25.76	60.95	2.00	0.00	0.56	0.00	25.92	61.38	2.00	0.00	0.56	0.00
26.08	62.03	2.00	0.00	0.56	0.00	26.25	59.77	2.00	0.00	0.56	0.00
26.41	58.73	2.00	0.00	0.55	0.00	26.58	58.72	2.00	0.00	0.55	0.00
26.74	60.64	2.00	0.00	0.55	0.00	26.90	63.33	2.00	0.00	0.54	0.00
27.07	68.76	2.00	0.00	0.54	0.00	27.23	74.32	2.00	0.00	0.54	0.00
27.40	80.62	2.00	0.00	0.54	0.00	27.56	84.51	2.00	0.00	0.53	0.00
27.72	86.53	2.00	0.00	0.53	0.00	27.89	85.43	2.00	0.00	0.53	0.00
28.05	83.37	2.00	0.00	0.52	0.00	28.22	81.71	2.00	0.00	0.52	0.00
28.38	78.80	2.00	0.00	0.52	0.00	28.54	74.76	2.00	0.00	0.52	0.00
28.71	69.83	2.00	0.00	0.51	0.00	28.87	67.98	2.00	0.00	0.51	0.00
29.04	68.55	2.00	0.00	0.51	0.00	29.20	70.04	2.00	0.00	0.51	0.00
29.36	71.52	2.00	0.00	0.50	0.00	29.53	73.77	2.00	0.00	0.50	0.00
29.69	77.95	2.00	0.00	0.50	0.00	29.86	81.73	2.00	0.00	0.49	0.00
30.02	86.37	2.00	0.00	0.49	0.00	30.18	91.01	2.00	0.00	0.49	0.00
30.35	94.48	2.00	0.00	0.49	0.00	30.51	97.01	2.00	0.00	0.48	0.00
30.68	102.14	2.00	0.00	0.48	0.00	30.84	100.28	2.00	0.00	0.48	0.00
31.00	95.12	2.00	0.00	0.47	0.00	31.17	82.13	2.00	0.00	0.47	0.00
31.33	74.95	2.00	0.00	0.47	0.00	31.50	69.56	2.00	0.00	0.47	0.00
31.66	67.74	2.00	0.00	0.46	0.00	31.82	71.49	2.00	0.00	0.46	0.00
31.99	77.11	2.00	0.00	0.46	0.00	32.15	81.56	2.00	0.00	0.46	0.00
32.32	80.87	2.00	0.00	0.45	0.00	32.48	80.15	2.00	0.00	0.45	0.00
32.64	77.02	0.26	1.29	0.45	0.03	32.81	78.63	2.00	0.00	0.44	0.00
32.97	77.27	2.00	0.00	0.44	0.00	33.14	73.79	2.00	0.00	0.44	0.00
33.30	67.88	2.00	0.00	0.44	0.00	33.47	63.91	2.00	0.00	0.43	0.00
33.63	65.81	2.00	0.00	0.43	0.00	33.79	68.14	2.00	0.00	0.43	0.00
33.96	72.22	2.00	0.00	0.42	0.00	34.12	78.01	2.00	0.00	0.42	0.00
34.28	84.11	2.00	0.00	0.42	0.00	34.45	88.01	2.00	0.00	0.42	0.00
34.61	85.90	2.00	0.00	0.41	0.00	34.78	80.52	2.00	0.00	0.41	0.00
34.94	74.41	2.00	0.00	0.41	0.00	35.11	71.18	2.00	0.00	0.41	0.00
35.27	69.53	2.00	0.00	0.40	0.00	35.43	70.63	2.00	0.00	0.40	0.00
35.60	73.02	2.00	0.00	0.40	0.00	35.76	73.95	2.00	0.00	0.39	0.00
35.93	73.50	2.00	0.00	0.39	0.00	36.09	73.39	2.00	0.00	0.39	0.00
36.25	73.88	2.00	0.00	0.39	0.00	36.42	74.65	2.00	0.00	0.38	0.00
36.58	74.20	2.00	0.00	0.38	0.00	36.75	72.83	2.00	0.00	0.38	0.00
36.91	68.64	2.00	0.00	0.37	0.00	37.07	63.63	2.00	0.00	0.37	0.00
37.24	67.03	2.00	0.00	0.37	0.00	37.40	83.22	2.00	0.00	0.37	0.00
37.57	97.72	2.00	0.00	0.36	0.00	37.73	103.23	2.00	0.00	0.36	0.00
37.89	92.60	2.00	0.00	0.36	0.00	38.06	77.09	2.00	0.00	0.35	0.00
38.22	60.85	2.00	0.00	0.35	0.00	38.39	56.45	2.00	0.00	0.35	0.00
38.55	57.02	2.00	0.00	0.35	0.00	38.71	60.57	2.00	0.00	0.34	0.00
38.88	64.25	2.00	0.00	0.34	0.00	39.04	65.94	2.00	0.00	0.34	0.00
39.21	68.96	2.00	0.00	0.34	0.00	39.37	74.17	2.00	0.00	0.33	0.00
39.53	80.50	2.00	0.00	0.33	0.00	39.70	83.87	2.00	0.00	0.33	0.00
39.86	83.53	2.00	0.00	0.32	0.00	40.03	82.20	2.00	0.00	0.32	0.00
40.19	81.19	2.00	0.00	0.32	0.00	40.35	80.23	2.00	0.00	0.32	0.00
40.52	77.48	2.00	0.00	0.31	0.00	40.68	74.29	2.00	0.00	0.31	0.00
40.85	72.70	2.00	0.00	0.31	0.00	41.01	73.90	2.00	0.00	0.30	0.00
41.18	84.86	2.00	0.00	0.30	0.00	41.34	90.94	2.00	0.00	0.30	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
41.50	94.10	2.00	0.00	0.30	0.00	41.67	87.02	2.00	0.00	0.29	0.00
41.83	79.47	2.00	0.00	0.29	0.00	42.00	71.84	2.00	0.00	0.29	0.00
42.16	68.70	2.00	0.00	0.29	0.00	42.32	67.87	2.00	0.00	0.28	0.00
42.49	67.93	2.00	0.00	0.28	0.00	42.65	67.44	2.00	0.00	0.28	0.00
42.82	67.82	2.00	0.00	0.27	0.00	42.98	68.64	2.00	0.00	0.27	0.00
43.14	68.60	2.00	0.00	0.27	0.00	43.31	66.75	2.00	0.00	0.27	0.00
43.47	65.83	2.00	0.00	0.26	0.00	43.64	69.27	2.00	0.00	0.26	0.00
43.80	82.56	2.00	0.00	0.26	0.00	43.96	98.41	2.00	0.00	0.25	0.00
44.13	110.94	2.00	0.00	0.25	0.00	44.29	115.38	2.00	0.00	0.25	0.00
44.46	111.12	2.00	0.00	0.25	0.00	44.62	103.25	2.00	0.00	0.24	0.00
44.78	97.09	2.00	0.00	0.24	0.00	44.95	93.90	2.00	0.00	0.24	0.00
45.11	90.42	2.00	0.00	0.24	0.00	45.28	82.37	2.00	0.00	0.23	0.00
45.44	75.14	2.00	0.00	0.23	0.00	45.60	71.88	2.00	0.00	0.23	0.00
45.77	73.33	2.00	0.00	0.22	0.00	45.93	70.74	2.00	0.00	0.22	0.00
46.10	65.99	2.00	0.00	0.22	0.00	46.26	60.28	2.00	0.00	0.22	0.00

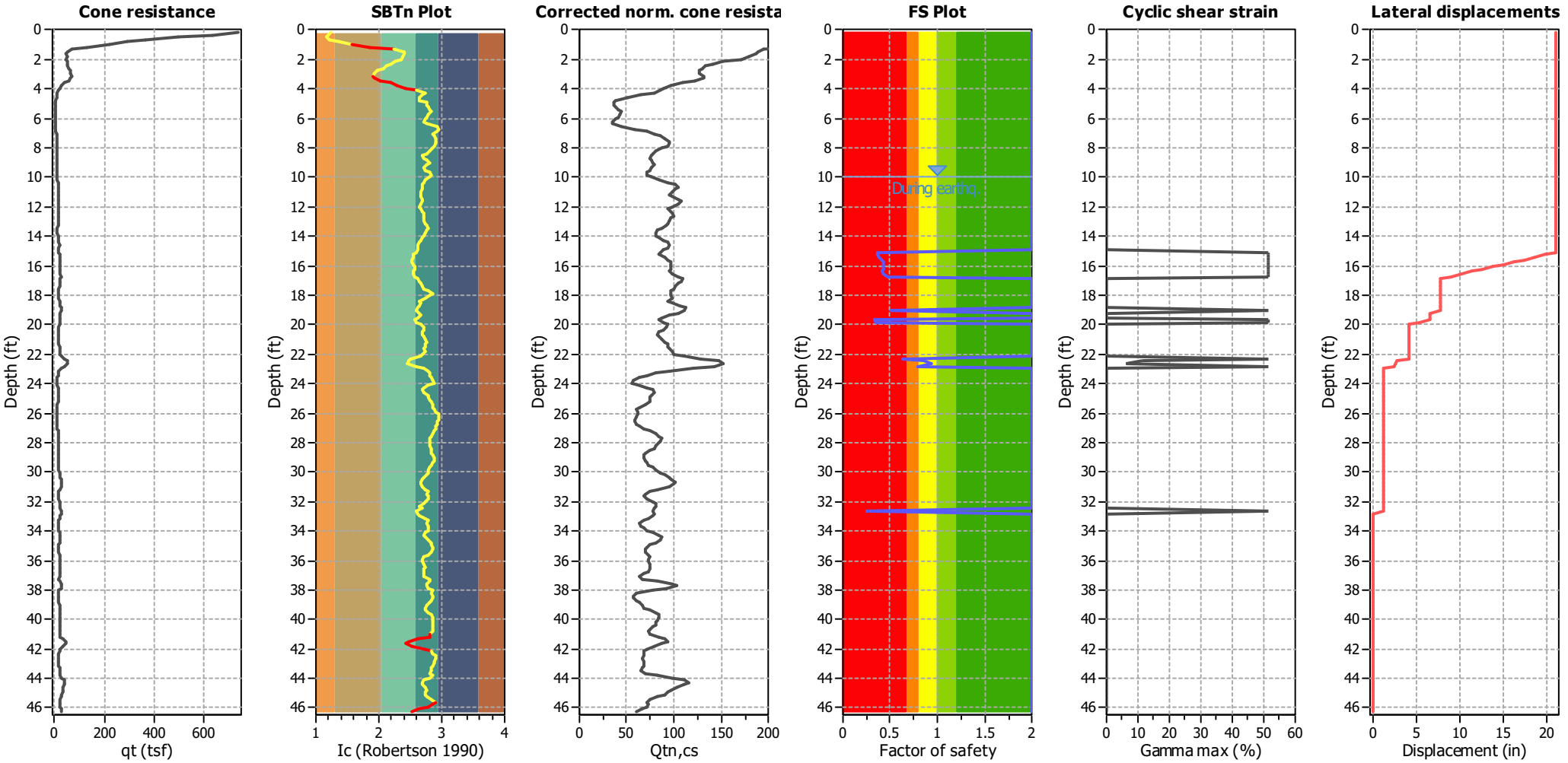
Total estimated settlement: 0.57

Abbreviations

$Q_{tn,cs}$: Equivalent clean sand normalized cone resistance
FS: Factor of safety against liquefaction
e_v (%): Post-liquefaction volumentric strain
DF: e_v depth weighting factor
Settlement: Calculated settlement

Estimation of post-earthquake lateral Displacements

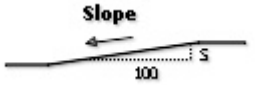
Geometric parameters: Gently sloping ground without free face (Slope 1.00 %)



Abbreviations

q_t: Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c: Soil Behaviour Type Index
$Q_{tn,cs}$: Equivalent clean sand normalized CPT total cone resistance
F.S.: Factor of safety
γ_{max}: Maximum cyclic shear strain
LDI: Lateral displacement index

Surface condition



:: Lateral displacement index calculation ::

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
10.01	10.51	16.01	2.34	76.64	2.00	6.52	0.00	0.00
10.17	12.67	19.47	2.51	84.82	2.00	12.98	0.00	0.00
10.34	15.18	23.47	2.72	94.43	2.00	19.16	0.00	0.00
10.50	16.52	25.61	2.95	101.43	2.00	22.05	0.00	0.00
10.66	17.21	26.71	3.04	104.63	2.00	23.42	0.00	0.00
10.83	17.06	26.45	2.91	102.08	2.00	23.10	0.00	0.00
10.99	16.66	25.80	2.74	98.09	2.00	22.28	0.00	0.00
11.16	16.50	25.52	2.56	94.53	2.00	21.92	0.00	0.00
11.32	16.81	26.01	2.77	99.07	2.00	22.55	0.00	0.00
11.48	17.15	26.52	3.05	104.79	2.00	23.19	0.00	0.00
11.65	18.03	27.70	3.13	107.97	2.00	24.63	0.00	0.00
11.81	18.02	27.42	2.94	104.07	2.00	24.29	0.00	0.00
11.98	17.99	27.05	2.63	97.96	2.00	23.84	0.00	0.00
12.14	16.79	25.11	2.58	94.36	2.00	21.39	0.00	0.00
12.30	16.33	24.37	2.73	96.08	2.00	20.41	0.00	0.00
12.47	16.32	24.30	2.91	99.12	2.00	20.30	0.00	0.00
12.63	16.52	24.45	2.91	99.36	2.00	20.50	0.00	0.00
12.80	16.16	23.74	2.83	96.91	2.00	19.54	0.00	0.00
12.96	15.65	22.85	2.77	94.58	2.00	18.27	0.00	0.00
13.12	14.88	21.64	2.83	93.83	2.00	16.48	0.00	0.00
13.29	14.01	20.28	2.85	91.96	2.00	14.34	0.00	0.00
13.45	13.07	18.80	2.74	87.86	2.00	11.83	0.00	0.00
13.62	12.82	18.25	2.50	83.31	2.00	10.86	0.00	0.00
13.78	13.36	18.83	2.28	80.69	2.00	11.89	0.00	0.00
13.94	14.13	19.77	2.21	80.82	2.00	13.49	0.00	0.00
14.11	15.28	21.26	2.29	84.18	2.00	15.89	0.00	0.00
14.27	17.31	23.93	2.33	88.55	2.00	19.80	0.00	0.00
14.44	19.35	26.59	2.42	93.64	2.00	23.28	0.00	0.00
14.60	20.34	27.76	2.40	94.69	2.00	24.70	0.00	0.00
14.76	19.74	26.81	2.41	93.69	2.00	23.55	0.00	0.00
14.93	19.20	25.85	2.21	88.59	2.00	22.35	0.00	0.00
15.09	19.72	26.31	2.03	85.62	0.37	22.93	51.20	1.21
15.26	21.16	27.96	1.91	84.91	0.36	24.94	51.20	1.21
15.42	22.91	30.16	2.03	89.80	0.39	27.43	51.20	1.21
15.58	24.70	32.35	2.11	93.77	0.41	29.75	51.20	1.21
15.75	25.40	33.15	2.22	96.99	0.43	30.56	51.20	1.21
15.91	25.28	32.85	2.24	97.23	0.43	30.25	51.20	1.21
16.08	24.34	31.52	2.32	97.40	0.43	28.90	51.20	1.21
16.24	23.92	30.82	2.33	96.85	0.42	28.16	51.20	1.21
16.40	24.71	31.62	2.24	95.74	0.41	28.99	51.20	1.21
16.57	25.57	32.59	2.33	98.95	0.43	30.00	51.20	1.21
16.73	26.00	33.09	2.57	104.61	0.47	30.49	51.20	1.21
16.90	24.92	31.71	2.91	109.83	2.00	29.09	0.00	0.00
17.06	23.55	29.85	2.97	108.41	2.00	27.10	0.00	0.00
17.22	22.19	27.96	2.90	104.48	2.00	24.93	0.00	0.00
17.39	20.94	26.23	2.86	101.50	2.00	22.83	0.00	0.00
17.55	19.07	23.79	2.95	99.50	2.00	19.60	0.00	0.00
17.72	16.73	20.75	3.05	96.20	2.00	15.10	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
17.88	14.86	18.36	3.38	96.66	2.00	11.06	0.00	0.00
18.05	16.33	20.05	3.14	96.32	2.00	13.97	0.00	0.00
18.21	18.82	22.97	2.91	97.63	2.00	18.44	0.00	0.00
18.37	21.60	26.11	2.47	94.09	2.00	22.68	0.00	0.00
18.54	21.81	26.30	2.68	98.32	2.00	22.91	0.00	0.00
18.70	24.63	29.63	2.89	106.72	2.00	26.85	0.00	0.00
18.87	27.77	33.26	2.97	112.97	2.00	30.67	0.00	0.00
19.03	28.14	33.50	2.87	111.41	0.50	30.91	51.20	1.21
19.19	24.66	29.17	2.80	104.40	2.00	26.34	0.00	0.00
19.36	21.12	24.78	2.61	95.02	2.00	20.95	0.00	0.00
19.52	21.74	25.27	2.19	87.87	2.00	21.59	0.00	0.00
19.69	23.41	27.01	1.95	84.84	0.33	23.79	51.20	1.21
19.85	23.60	27.17	2.12	88.60	0.34	23.99	51.20	1.21
20.01	21.91	25.18	2.46	92.88	2.00	21.49	0.00	0.00
20.18	19.78	22.62	2.65	92.71	2.00	17.94	0.00	0.00
20.34	19.08	21.66	2.47	88.34	2.00	16.51	0.00	0.00
20.51	18.74	21.12	2.28	84.27	2.00	15.68	0.00	0.00
20.67	18.75	21.02	2.19	82.54	2.00	15.51	0.00	0.00
20.83	18.23	20.34	2.31	83.71	2.00	14.44	0.00	0.00
21.00	18.29	20.35	2.53	87.48	2.00	14.46	0.00	0.00
21.16	18.64	20.70	2.70	90.81	2.00	15.01	0.00	0.00
21.33	19.44	21.51	2.77	93.19	2.00	16.28	0.00	0.00
21.49	20.19	22.26	2.74	93.90	2.00	17.41	0.00	0.00
21.65	20.89	22.94	2.79	95.71	2.00	18.41	0.00	0.00
21.82	21.15	23.15	2.89	97.72	2.00	18.71	0.00	0.00
21.98	23.33	25.46	2.82	99.88	2.00	21.84	0.00	0.00
22.15	26.82	29.29	3.16	111.60	2.00	26.48	0.00	0.00
22.31	42.34	46.17	2.94	128.12	0.63	41.49	51.20	1.21
22.47	51.38	55.91	3.26	146.85	0.86	47.81	11.20	0.26
22.64	54.30	58.85	3.35	152.42	0.94	49.50	6.42	0.15
22.80	40.10	43.30	3.73	142.38	0.80	39.37	51.20	1.21
22.97	28.08	29.98	3.59	120.40	2.00	27.24	0.00	0.00
23.13	19.74	20.66	2.98	95.31	2.00	14.94	0.00	0.00
23.29	16.16	16.60	2.43	80.21	2.00	7.73	0.00	0.00
23.46	14.14	14.30	2.07	71.00	2.00	2.79	0.00	0.00
23.62	12.59	12.53	1.79	64.13	2.00	0.00	0.00	0.00
23.79	11.12	10.86	1.55	57.90	2.00	0.00	0.00	0.00
23.95	10.61	10.26	1.48	55.82	2.00	0.00	0.00	0.00
24.11	13.40	13.21	1.57	61.70	2.00	0.19	0.00	0.00
24.28	17.63	17.69	1.81	71.73	2.00	9.83	0.00	0.00
24.44	19.86	19.99	1.97	77.47	2.00	13.86	0.00	0.00
24.61	19.11	19.13	2.12	79.06	2.00	12.42	0.00	0.00
24.77	16.85	16.68	2.20	76.86	2.00	7.89	0.00	0.00
24.93	16.33	16.06	2.15	75.04	2.00	6.63	0.00	0.00
25.10	15.79	15.42	2.22	75.26	2.00	5.29	0.00	0.00
25.26	15.17	14.70	2.22	74.07	2.00	3.72	0.00	0.00
25.43	13.98	13.39	2.12	70.41	2.00	0.63	0.00	0.00
25.59	12.78	12.06	1.82	63.79	2.00	0.00	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
25.76	11.97	11.16	1.72	60.95	2.00	0.00	0.00	0.00
25.92	11.51	10.64	1.82	61.38	2.00	0.00	0.00	0.00
26.08	10.99	10.06	1.96	62.03	2.00	0.00	0.00	0.00
26.25	10.59	9.60	1.85	59.77	2.00	0.00	0.00	0.00
26.41	10.46	9.42	1.80	58.73	2.00	0.00	0.00	0.00
26.58	10.90	9.83	1.73	58.72	2.00	0.00	0.00	0.00
26.74	11.27	10.17	1.83	60.64	2.00	0.00	0.00	0.00
26.90	11.98	10.86	1.93	63.33	2.00	0.00	0.00	0.00
27.07	12.96	11.81	2.21	68.76	2.00	0.00	0.00	0.00
27.23	14.60	13.43	2.40	74.32	2.00	0.74	0.00	0.00
27.40	16.40	15.19	2.62	80.62	2.00	4.80	0.00	0.00
27.56	17.98	16.72	2.70	84.51	2.00	7.96	0.00	0.00
27.72	18.93	17.59	2.73	86.53	2.00	9.65	0.00	0.00
27.89	19.15	17.74	2.64	85.43	2.00	9.92	0.00	0.00
28.05	18.62	17.13	2.57	83.37	2.00	8.76	0.00	0.00
28.22	18.08	16.52	2.53	81.71	2.00	7.57	0.00	0.00
28.38	17.07	15.45	2.45	78.80	2.00	5.35	0.00	0.00
28.54	16.22	14.54	2.28	74.76	2.00	3.36	0.00	0.00
28.71	15.25	13.52	2.06	69.83	2.00	0.95	0.00	0.00
28.87	14.72	12.95	2.00	67.98	2.00	0.00	0.00	0.00
29.04	14.43	12.61	2.08	68.55	2.00	0.00	0.00	0.00
29.20	14.38	12.50	2.20	70.04	2.00	0.00	0.00	0.00
29.36	15.20	13.25	2.21	71.52	2.00	0.29	0.00	0.00
29.53	16.62	14.57	2.21	73.77	2.00	3.43	0.00	0.00
29.69	18.52	16.34	2.29	77.95	2.00	7.21	0.00	0.00
29.86	19.83	17.53	2.41	81.73	2.00	9.53	0.00	0.00
30.02	20.87	18.46	2.62	86.37	2.00	11.23	0.00	0.00
30.18	22.76	20.19	2.74	91.01	2.00	14.19	0.00	0.00
30.35	25.42	22.63	2.72	94.48	2.00	17.96	0.00	0.00
30.51	27.45	24.46	2.72	97.01	2.00	20.53	0.00	0.00
30.68	30.48	27.23	2.79	102.14	2.00	24.06	0.00	0.00
30.84	30.30	26.95	2.71	100.28	2.00	23.73	0.00	0.00
31.00	27.42	24.14	2.63	95.12	2.00	20.09	0.00	0.00
31.17	22.13	19.09	2.29	82.13	2.00	12.34	0.00	0.00
31.33	18.90	16.00	2.13	74.95	2.00	6.50	0.00	0.00
31.50	18.30	15.39	1.85	69.56	2.00	5.22	0.00	0.00
31.66	17.64	14.71	1.79	67.74	2.00	3.74	0.00	0.00
31.82	18.28	15.24	1.98	71.49	2.00	4.91	0.00	0.00
31.99	20.98	17.68	2.11	77.11	2.00	9.80	0.00	0.00
32.15	23.33	19.77	2.20	81.56	2.00	13.50	0.00	0.00
32.32	25.84	22.00	2.00	80.87	2.00	17.03	0.00	0.00
32.48	24.45	20.65	2.06	80.15	2.00	14.93	0.00	0.00
32.64	27.37	23.26	1.74	77.02	0.26	18.86	51.20	1.21
32.81	26.84	22.68	1.85	78.63	2.00	18.02	0.00	0.00
32.97	25.82	21.67	1.84	77.27	2.00	16.53	0.00	0.00
33.14	21.22	17.41	1.93	73.79	2.00	9.31	0.00	0.00
33.30	18.06	14.51	1.82	67.88	2.00	3.28	0.00	0.00
33.47	17.91	14.33	1.59	63.91	2.00	2.88	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
33.63	17.52	13.92	1.74	65.81	2.00	1.91	0.00	0.00
33.79	18.32	14.58	1.83	68.14	2.00	3.45	0.00	0.00
33.96	19.37	15.45	2.00	72.22	2.00	5.35	0.00	0.00
34.12	22.50	18.17	2.12	78.01	2.00	10.72	0.00	0.00
34.28	24.76	20.10	2.32	84.11	2.00	14.03	0.00	0.00
34.45	25.17	20.37	2.53	88.01	2.00	14.48	0.00	0.00
34.61	22.62	18.03	2.62	85.90	2.00	10.46	0.00	0.00
34.78	20.18	15.83	2.51	80.52	2.00	6.16	0.00	0.00
34.94	18.65	14.44	2.25	74.41	2.00	3.13	0.00	0.00
35.11	17.70	13.56	2.13	71.18	2.00	1.06	0.00	0.00
35.27	17.42	13.27	2.05	69.53	2.00	0.34	0.00	0.00
35.43	18.36	14.04	2.04	70.63	2.00	2.21	0.00	0.00
35.60	20.35	15.71	2.03	73.02	2.00	5.92	0.00	0.00
35.76	22.73	17.73	1.91	73.95	2.00	9.91	0.00	0.00
35.93	24.35	19.08	1.79	73.50	2.00	12.33	0.00	0.00
36.09	24.12	18.82	1.80	73.39	2.00	11.87	0.00	0.00
36.25	23.24	17.99	1.89	73.88	2.00	10.38	0.00	0.00
36.42	22.63	17.39	1.98	74.65	2.00	9.26	0.00	0.00
36.58	23.42	18.01	1.90	74.20	2.00	10.41	0.00	0.00
36.75	23.23	17.79	1.84	72.83	2.00	10.01	0.00	0.00
36.91	22.42	17.06	1.66	68.64	2.00	8.63	0.00	0.00
37.07	20.32	15.24	1.50	63.63	2.00	4.91	0.00	0.00
37.24	18.91	13.95	1.81	67.03	2.00	1.99	0.00	0.00
37.40	22.39	16.75	2.58	83.22	2.00	8.03	0.00	0.00
37.57	28.53	21.81	2.98	97.72	2.00	16.73	0.00	0.00
37.73	30.28	23.17	3.18	103.23	2.00	18.74	0.00	0.00
37.89	26.43	19.90	2.85	92.60	2.00	13.71	0.00	0.00
38.06	19.82	14.37	2.44	77.09	2.00	2.98	0.00	0.00
38.22	17.03	12.09	1.59	60.85	2.00	0.00	0.00	0.00
38.39	15.56	10.85	1.43	56.45	2.00	0.00	0.00	0.00
38.55	15.77	10.98	1.45	57.02	2.00	0.00	0.00	0.00
38.71	17.24	12.15	1.57	60.57	2.00	0.00	0.00	0.00
38.88	18.93	13.48	1.67	64.25	2.00	0.86	0.00	0.00
39.04	20.62	14.83	1.66	65.94	2.00	4.01	0.00	0.00
39.21	22.16	16.03	1.75	68.96	2.00	6.58	0.00	0.00
39.37	23.45	17.00	1.98	74.17	2.00	8.51	0.00	0.00
39.53	23.57	16.98	2.37	80.50	2.00	8.48	0.00	0.00
39.70	22.98	16.40	2.66	83.87	2.00	7.34	0.00	0.00
39.86	22.11	15.63	2.74	83.53	2.00	5.75	0.00	0.00
40.03	21.73	15.27	2.69	82.20	2.00	4.98	0.00	0.00
40.19	21.66	15.17	2.63	81.19	2.00	4.75	0.00	0.00
40.35	21.50	14.99	2.59	80.23	2.00	4.36	0.00	0.00
40.52	20.82	14.41	2.46	77.48	2.00	3.05	0.00	0.00
40.68	20.07	13.77	2.32	74.29	2.00	1.57	0.00	0.00
40.85	20.25	13.88	2.19	72.70	2.00	1.83	0.00	0.00
41.01	21.65	14.95	2.15	73.90	2.00	4.28	0.00	0.00
41.18	24.58	17.16	2.64	84.86	2.00	8.81	0.00	0.00
41.34	35.44	25.82	2.28	90.94	2.00	22.31	0.00	0.00

:: Estimation of post-earthquake lateral Displacements :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	R_f (%)	$Q_{tn,cs}$	FS	D_r	$Gamma_{max}$ (%)	Lat. disp. (in)
41.50	46.68	34.90	1.98	94.10	2.00	32.25	0.00	0.00
41.67	47.56	35.66	1.65	87.02	2.00	32.96	0.00	0.00
41.83	36.90	26.93	1.67	79.47	2.00	23.70	0.00	0.00
42.00	24.51	16.93	1.84	71.84	2.00	8.37	0.00	0.00
42.16	20.53	13.73	1.93	68.70	2.00	1.46	0.00	0.00
42.32	19.20	12.63	2.00	67.87	2.00	0.00	0.00	0.00
42.49	18.42	11.98	2.09	67.93	2.00	0.00	0.00	0.00
42.65	18.41	11.93	2.06	67.44	2.00	0.00	0.00	0.00
42.82	18.89	12.25	2.04	67.82	2.00	0.00	0.00	0.00
42.98	19.53	12.70	2.04	68.64	2.00	0.00	0.00	0.00
43.14	19.84	12.90	2.02	68.60	2.00	0.00	0.00	0.00
43.31	20.18	13.15	1.86	66.75	2.00	0.04	0.00	0.00
43.47	20.26	13.18	1.80	65.83	2.00	0.11	0.00	0.00
43.64	21.37	13.95	1.95	69.27	2.00	2.00	0.00	0.00
43.80	23.93	15.74	2.65	82.56	2.00	5.97	0.00	0.00
43.96	30.42	20.53	3.15	98.41	2.00	14.73	0.00	0.00
44.13	38.85	26.85	3.29	110.94	2.00	23.60	0.00	0.00
44.29	42.52	29.56	3.31	115.38	2.00	26.77	0.00	0.00
44.46	41.23	28.51	3.16	111.12	2.00	25.58	0.00	0.00
44.62	35.35	23.96	3.10	103.25	2.00	19.85	0.00	0.00
44.78	32.33	21.63	2.95	97.09	2.00	16.47	0.00	0.00
44.95	32.26	21.55	2.76	93.90	2.00	16.35	0.00	0.00
45.11	31.78	21.16	2.58	90.42	2.00	15.74	0.00	0.00
45.28	28.30	18.54	2.33	82.37	2.00	11.38	0.00	0.00
45.44	23.10	14.62	2.26	75.14	2.00	3.54	0.00	0.00
45.60	20.58	12.70	2.28	71.88	2.00	0.00	0.00	0.00
45.77	21.95	13.68	2.25	73.33	2.00	1.33	0.00	0.00
45.93	23.88	15.12	1.92	70.74	2.00	4.65	0.00	0.00
46.10	27.95	18.26	1.44	65.99	2.00	10.88	0.00	0.00
46.26	31.19	20.84	1.06	60.28	2.00	15.23	0.00	0.00

Total estimated displacement: 20.97

Abbreviations

q_t: Total cone resistance
Q_{tn}: Adjusted cone resistance to an effective overburden stress of 1 atm
R_f: Friction ration
$Q_{tn,cs}$: Adjusted and corrected cone resistance due to fines
FS: Calculated factor of safety against liquefaction
D_r: Calculated relative density
$Gamma_{max}$: Calculated maximum cyclic shear strain
Lat. disp.: Lateral displacement

:: Strength loss calculation (Robertson (2009) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.16	735.34	1181.42	1.00	1181.42	1.23	N/A	N/A
0.33	636.45	1022.51	1.00	1022.51	1.19	N/A	N/A
0.49	498.28	800.51	1.00	800.51	1.15	N/A	N/A
0.66	361.66	580.98	1.00	580.98	1.20	N/A	N/A
0.82	290.88	467.25	1.00	467.25	1.35	N/A	N/A
0.98	217.65	349.57	1.00	349.57	1.57	N/A	N/A
1.15	132.83	213.29	1.15	245.06	1.85	N/A	N/A
1.31	68.11	109.29	1.79	195.20	2.25	N/A	N/A
1.48	50.78	81.44	2.32	188.60	2.40	N/A	N/A
1.64	49.00	78.55	2.38	186.69	2.42	N/A	N/A
1.80	50.03	80.19	2.24	179.94	2.38	N/A	N/A
1.97	49.17	78.80	2.17	171.13	2.36	N/A	N/A
2.13	52.42	84.00	1.81	151.66	2.25	N/A	N/A
2.30	53.47	85.67	1.65	141.66	2.19	N/A	N/A
2.46	55.31	88.61	1.50	133.24	2.13	N/A	N/A
2.63	58.46	93.65	1.39	129.93	2.06	N/A	N/A
2.79	62.42	100.00	1.28	127.73	1.98	N/A	N/A
2.95	65.10	104.29	1.21	126.45	1.92	N/A	N/A
3.12	68.67	110.02	1.19	131.11	1.90	N/A	N/A
3.28	67.32	107.82	1.22	131.66	1.93	N/A	N/A
3.45	57.18	91.52	1.34	122.96	2.03	N/A	N/A
3.61	41.67	66.59	1.64	109.25	2.19	N/A	N/A
3.77	31.63	50.44	1.92	96.92	2.29	N/A	N/A
3.94	23.00	36.57	2.42	88.65	2.43	N/A	N/A
4.10	16.73	26.48	3.23	85.42	2.58	N/A	N/A
4.27	11.91	18.72	4.25	79.60	2.73	N/A	N/A
4.43	10.72	16.80	3.90	65.49	2.69	N/A	N/A
4.59	8.88	13.82	3.67	50.77	2.65	N/A	N/A
4.76	6.80	10.47	3.62	37.85	2.65	N/A	N/A
4.92	5.21	7.91	4.52	35.72	2.77	N/A	N/A
5.09	5.30	8.03	4.45	35.73	2.76	N/A	N/A
5.25	5.44	8.25	4.59	37.90	2.78	N/A	N/A
5.41	5.56	8.43	4.93	41.56	2.82	N/A	N/A
5.58	5.83	8.84	5.00	44.19	2.82	N/A	N/A
5.74	6.07	9.22	4.72	43.55	2.79	N/A	N/A
5.91	6.19	9.41	4.44	41.80	2.76	N/A	N/A
6.07	5.97	9.04	4.30	38.87	2.74	N/A	N/A
6.23	5.60	8.43	4.18	35.27	2.73	N/A	N/A
6.40	5.26	7.87	4.42	34.76	2.76	N/A	N/A
6.56	5.00	7.45	5.99	44.63	2.93	N/A	N/A
6.73	6.22	9.40	6.18	58.07	2.95	N/A	N/A
6.89	7.85	11.99	5.90	70.82	2.92	N/A	N/A
7.05	9.61	14.81	5.36	79.42	2.86	N/A	N/A
7.22	10.16	15.68	5.49	86.02	2.88	N/A	N/A
7.38	10.43	16.10	5.64	90.72	2.89	N/A	N/A
7.55	10.64	16.43	5.76	94.61	2.91	N/A	N/A
7.71	10.88	16.79	5.70	95.64	2.90	N/A	N/A
7.87	10.92	16.84	5.53	93.18	2.88	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
8.04	10.82	16.67	5.22	86.97	2.85	N/A	N/A
8.20	10.97	16.90	4.81	81.30	2.80	N/A	N/A
8.37	11.48	17.70	4.39	77.65	2.75	N/A	N/A
8.53	12.32	19.03	3.99	75.97	2.70	N/A	N/A
8.69	12.01	18.53	4.07	75.31	2.71	N/A	N/A
8.86	11.11	17.07	4.47	76.25	2.76	N/A	N/A
9.02	10.69	16.37	4.77	78.16	2.80	N/A	N/A
9.19	11.53	17.72	4.47	79.18	2.76	N/A	N/A
9.35	12.25	18.86	4.07	76.80	2.71	N/A	N/A
9.51	11.45	17.55	4.21	73.83	2.73	N/A	N/A
9.68	9.85	14.98	4.77	71.43	2.80	N/A	N/A
9.84	9.27	14.02	5.15	72.14	2.84	N/A	N/A
10.01	10.51	16.01	4.79	76.64	2.80	1.30	1.30
10.17	12.67	19.47	4.36	84.82	2.75	1.57	1.57
10.34	15.18	23.47	4.02	94.43	2.70	1.88	1.88
10.50	16.52	25.61	3.96	101.43	2.70	2.03	2.03
10.66	17.21	26.71	3.92	104.63	2.69	2.10	2.10
10.83	17.06	26.45	3.86	102.08	2.68	2.07	2.07
10.99	16.66	25.80	3.80	98.09	2.67	2.00	2.00
11.16	16.50	25.52	3.70	94.53	2.66	1.97	1.97
11.32	16.81	26.01	3.81	99.07	2.67	1.99	1.99
11.48	17.15	26.52	3.95	104.79	2.69	2.02	2.02
11.65	18.03	27.70	3.90	107.97	2.69	2.11	2.11
11.81	18.02	27.42	3.80	104.07	2.67	2.09	2.09
11.98	17.99	27.05	3.62	97.96	2.65	2.07	2.07
12.14	16.79	25.11	3.76	94.36	2.67	1.92	1.92
12.30	16.33	24.37	3.94	96.08	2.69	1.85	1.85
12.47	16.32	24.30	4.08	99.12	2.71	1.83	1.83
12.63	16.52	24.45	4.06	99.36	2.71	1.84	1.84
12.80	16.16	23.74	4.08	96.91	2.71	1.79	1.79
12.96	15.65	22.85	4.14	94.58	2.72	1.72	1.72
13.12	14.88	21.64	4.34	93.83	2.74	1.62	1.62
13.29	14.01	20.28	4.53	91.96	2.77	1.51	1.51
13.45	13.07	18.80	4.67	87.86	2.79	1.39	1.39
13.62	12.82	18.25	4.56	83.31	2.77	1.35	1.35
13.78	13.36	18.83	4.29	80.69	2.74	1.41	1.41
13.94	14.13	19.77	4.09	80.82	2.71	1.48	1.48
14.11	15.28	21.26	3.96	84.18	2.69	1.60	1.60
14.27	17.31	23.93	3.70	88.55	2.66	1.81	1.81
14.44	19.35	26.59	3.52	93.64	2.63	2.02	2.02
14.60	20.34	27.76	3.41	94.69	2.61	2.11	2.11
14.76	19.74	26.81	3.49	93.69	2.63	2.04	2.04
14.93	19.20	25.85	3.43	88.59	2.62	1.96	1.96
15.09	19.72	26.31	3.25	85.62	2.59	0.65	0.65
15.26	21.16	27.96	3.04	84.91	2.55	0.66	0.66
15.42	22.91	30.16	2.98	89.80	2.54	0.67	0.67
15.58	24.70	32.35	2.90	93.77	2.53	0.68	0.68
15.75	25.40	33.15	2.93	96.99	2.53	0.68	0.68

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
15.91	25.28	32.85	2.96	97.23	2.54	0.68	0.68
16.08	24.34	31.52	3.09	97.40	2.56	0.68	0.68
16.24	23.92	30.82	3.14	96.85	2.57	0.67	0.67
16.40	24.71	31.62	3.03	95.74	2.55	0.68	0.68
16.57	25.57	32.59	3.04	98.95	2.55	0.68	0.68
16.73	26.00	33.09	3.16	104.61	2.57	0.68	0.68
16.90	24.92	31.71	3.46	109.83	2.62	2.38	2.38
17.06	23.55	29.85	3.63	108.41	2.65	2.23	2.23
17.22	22.19	27.96	3.74	104.48	2.66	2.09	2.09
17.39	20.94	26.23	3.87	101.50	2.68	1.95	1.95
17.55	19.07	23.79	4.18	99.50	2.73	1.76	1.76
17.72	16.73	20.75	4.64	96.20	2.78	1.52	1.52
17.88	14.86	18.36	5.26	96.66	2.85	1.33	1.33
18.05	16.33	20.05	4.80	96.32	2.80	1.47	1.47
18.21	18.82	22.97	4.25	97.63	2.73	1.69	1.69
18.37	21.60	26.11	3.60	94.09	2.64	1.94	1.94
18.54	21.81	26.30	3.74	98.32	2.66	1.95	1.95
18.70	24.63	29.63	3.60	106.72	2.64	2.20	2.20
18.87	27.77	33.26	3.40	112.97	2.61	2.48	2.48
19.03	28.14	33.50	3.33	111.41	2.60	0.68	0.68
19.19	24.66	29.17	3.58	104.40	2.64	2.17	2.17
19.36	21.12	24.78	3.83	95.02	2.68	1.83	1.83
19.52	21.74	25.27	3.48	87.87	2.62	1.88	1.88
19.69	23.41	27.01	3.14	84.84	2.57	0.66	0.66
19.85	23.60	27.17	3.26	88.60	2.59	0.66	0.66
20.01	21.91	25.18	3.69	92.88	2.66	1.86	1.86
20.18	19.78	22.62	4.10	92.71	2.71	1.66	1.66
20.34	19.08	21.66	4.08	88.34	2.71	1.59	1.59
20.51	18.74	21.12	3.99	84.27	2.70	1.55	1.55
20.67	18.75	21.02	3.93	82.54	2.69	1.54	1.54
20.83	18.23	20.34	4.11	83.71	2.72	1.49	1.49
21.00	18.29	20.35	4.30	87.48	2.74	1.49	1.49
21.16	18.64	20.70	4.39	90.81	2.75	1.51	1.51
21.33	19.44	21.51	4.33	93.19	2.74	1.57	1.57
21.49	20.19	22.26	4.22	93.90	2.73	1.63	1.63
21.65	20.89	22.94	4.17	95.71	2.72	1.68	1.68
21.82	21.15	23.15	4.22	97.72	2.73	1.69	1.69
21.98	23.33	25.46	3.92	99.88	2.69	1.86	1.86
22.15	26.82	29.29	3.81	111.60	2.67	2.14	2.14
22.31	42.34	46.17	2.77	128.12	2.50	0.72	0.72
22.47	51.38	55.91	2.63	146.85	2.47	0.75	0.75
22.64	54.30	58.85	2.59	152.42	2.46	0.76	0.76
22.80	40.10	43.30	3.29	142.38	2.59	0.72	0.72
22.97	28.08	29.98	4.02	120.40	2.70	2.18	2.18
23.13	19.74	20.66	4.61	95.31	2.78	1.50	1.50
23.29	16.16	16.60	4.83	80.21	2.81	1.20	1.20
23.46	14.14	14.30	4.97	71.00	2.82	1.03	1.03
23.62	12.59	12.53	5.12	64.13	2.84	0.25	0.90

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
23.79	11.12	10.86	5.33	57.90	2.86	0.19	0.78
23.95	10.61	10.26	5.44	55.82	2.87	0.14	0.74
24.11	13.40	13.21	4.67	61.70	2.79	0.20	0.95
24.28	17.63	17.69	4.05	71.73	2.71	1.28	1.28
24.44	19.86	19.99	3.88	77.47	2.68	1.45	1.45
24.61	19.11	19.13	4.13	79.06	2.72	1.39	1.39
24.77	16.85	16.68	4.61	76.86	2.78	1.20	1.20
24.93	16.33	16.06	4.67	75.04	2.79	1.16	1.16
25.10	15.79	15.42	4.88	75.26	2.81	1.11	1.11
25.26	15.17	14.70	5.04	74.07	2.83	1.06	1.06
25.43	13.98	13.39	5.26	70.41	2.85	0.96	0.96
25.59	12.78	12.06	5.29	63.79	2.86	0.23	0.87
25.76	11.97	11.16	5.46	60.95	2.88	0.19	0.80
25.92	11.51	10.64	5.77	61.38	2.91	0.24	0.76
26.08	10.99	10.06	6.16	62.03	2.95	0.23	0.72
26.25	10.59	9.60	6.23	59.77	2.95	0.20	0.69
26.41	10.46	9.42	6.23	58.73	2.95	0.18	0.67
26.58	10.90	9.83	5.98	58.72	2.93	0.21	0.70
26.74	11.27	10.17	5.96	60.64	2.93	0.21	0.73
26.90	11.98	10.86	5.83	63.33	2.91	0.23	0.78
27.07	12.96	11.81	5.82	68.76	2.91	0.28	0.85
27.23	14.60	13.43	5.53	74.32	2.88	0.96	0.96
27.40	16.40	15.19	5.31	80.62	2.86	1.09	1.09
27.56	17.98	16.72	5.05	84.51	2.83	1.20	1.20
27.72	18.93	17.59	4.92	86.53	2.82	1.26	1.26
27.89	19.15	17.74	4.82	85.43	2.80	1.27	1.27
28.05	18.62	17.13	4.87	83.37	2.81	1.23	1.23
28.22	18.08	16.52	4.95	81.71	2.82	1.18	1.18
28.38	17.07	15.45	5.10	78.80	2.84	1.11	1.11
28.54	16.22	14.54	5.14	74.76	2.84	1.04	1.04
28.71	15.25	13.52	5.17	69.83	2.84	0.30	0.97
28.87	14.72	12.95	5.25	67.98	2.85	0.27	0.93
29.04	14.43	12.61	5.44	68.55	2.87	0.30	0.90
29.20	14.38	12.50	5.60	70.04	2.89	0.89	0.89
29.36	15.20	13.25	5.40	71.52	2.87	0.95	0.95
29.53	16.62	14.57	5.06	73.77	2.83	1.04	1.04
29.69	18.52	16.34	4.77	77.95	2.80	1.17	1.17
29.86	19.83	17.53	4.66	81.73	2.79	1.25	1.25
30.02	20.87	18.46	4.68	86.37	2.79	1.32	1.32
30.18	22.76	20.19	4.51	91.01	2.77	1.44	1.44
30.35	25.42	22.63	4.18	94.48	2.72	1.62	1.62
30.51	27.45	24.46	3.97	97.01	2.70	1.75	1.75
30.68	30.48	27.23	3.75	102.14	2.67	1.95	1.95
30.84	30.30	26.95	3.72	100.28	2.66	1.92	1.92
31.00	27.42	24.14	3.94	95.12	2.69	1.72	1.72
31.17	22.13	19.09	4.30	82.13	2.74	1.36	1.36
31.33	18.90	16.00	4.69	74.95	2.79	1.14	1.14
31.50	18.30	15.39	4.52	69.56	2.77	0.31	1.10

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
31.66	17.64	14.71	4.61	67.74	2.78	0.27	1.05
31.82	18.28	15.24	4.69	71.49	2.79	1.09	1.09
31.99	20.98	17.68	4.36	77.11	2.75	1.26	1.26
32.15	23.33	19.77	4.13	81.56	2.72	1.41	1.41
32.32	25.84	22.00	3.68	80.87	2.65	1.56	1.56
32.48	24.45	20.65	3.88	80.15	2.68	1.47	1.47
32.64	27.37	23.26	3.31	77.02	2.60	0.64	0.64
32.81	26.84	22.68	3.47	78.63	2.62	1.61	1.61
32.97	25.82	21.67	3.57	77.27	2.64	1.54	1.54
33.14	21.22	17.41	4.24	73.79	2.73	1.24	1.24
33.30	18.06	14.51	4.68	67.88	2.79	0.24	1.03
33.47	17.91	14.33	4.46	63.91	2.76	0.26	1.02
33.63	17.52	13.92	4.73	65.81	2.79	0.25	0.99
33.79	18.32	14.58	4.67	68.14	2.79	0.29	1.04
33.96	19.37	15.45	4.68	72.22	2.79	1.10	1.10
34.12	22.50	18.17	4.29	78.01	2.74	1.29	1.29
34.28	24.76	20.10	4.19	84.11	2.73	1.42	1.42
34.45	25.17	20.37	4.32	88.01	2.74	1.44	1.44
34.61	22.62	18.03	4.76	85.90	2.80	1.28	1.28
34.78	20.18	15.83	5.09	80.52	2.83	1.13	1.13
34.94	18.65	14.44	5.15	74.41	2.84	1.03	1.03
35.11	17.70	13.56	5.25	71.18	2.85	0.96	0.96
35.27	17.42	13.27	5.24	69.53	2.85	0.29	0.94
35.43	18.36	14.04	5.03	70.63	2.83	1.00	1.00
35.60	20.35	15.71	4.65	73.02	2.78	1.11	1.11
35.76	22.73	17.73	4.17	73.95	2.72	1.25	1.25
35.93	24.35	19.08	3.85	73.50	2.68	1.35	1.35
36.09	24.12	18.82	3.90	73.39	2.69	1.33	1.33
36.25	23.24	17.99	4.11	73.88	2.72	1.27	1.27
36.42	22.63	17.39	4.29	74.65	2.74	1.23	1.23
36.58	23.42	18.01	4.12	74.20	2.72	1.27	1.27
36.75	23.23	17.79	4.09	72.83	2.71	1.25	1.25
36.91	22.42	17.06	4.02	68.64	2.70	0.32	1.20
37.07	20.32	15.24	4.18	63.63	2.72	0.24	1.07
37.24	18.91	13.95	4.80	67.03	2.80	0.20	0.99
37.40	22.39	16.75	4.97	83.22	2.82	1.19	1.19
37.57	28.53	21.81	4.48	97.72	2.76	1.54	1.54
37.73	30.28	23.17	4.46	103.23	2.76	1.63	1.63
37.89	26.43	19.90	4.65	92.60	2.78	1.41	1.41
38.06	19.82	14.37	5.36	77.09	2.86	1.02	1.02
38.22	17.03	12.09	5.03	60.85	2.83	0.20	0.86
38.39	15.56	10.85	5.20	56.45	2.85	0.16	0.77
38.55	15.77	10.98	5.19	57.02	2.85	0.17	0.78
38.71	17.24	12.15	4.99	60.57	2.82	0.22	0.86
38.88	18.93	13.48	4.77	64.25	2.80	0.25	0.95
39.04	20.62	14.83	4.45	65.94	2.76	0.28	1.04
39.21	22.16	16.03	4.30	68.96	2.74	0.28	1.13
39.37	23.45	17.00	4.36	74.17	2.75	1.20	1.20

:: Strength loss calculation (Robertson (2009) :: (continued)

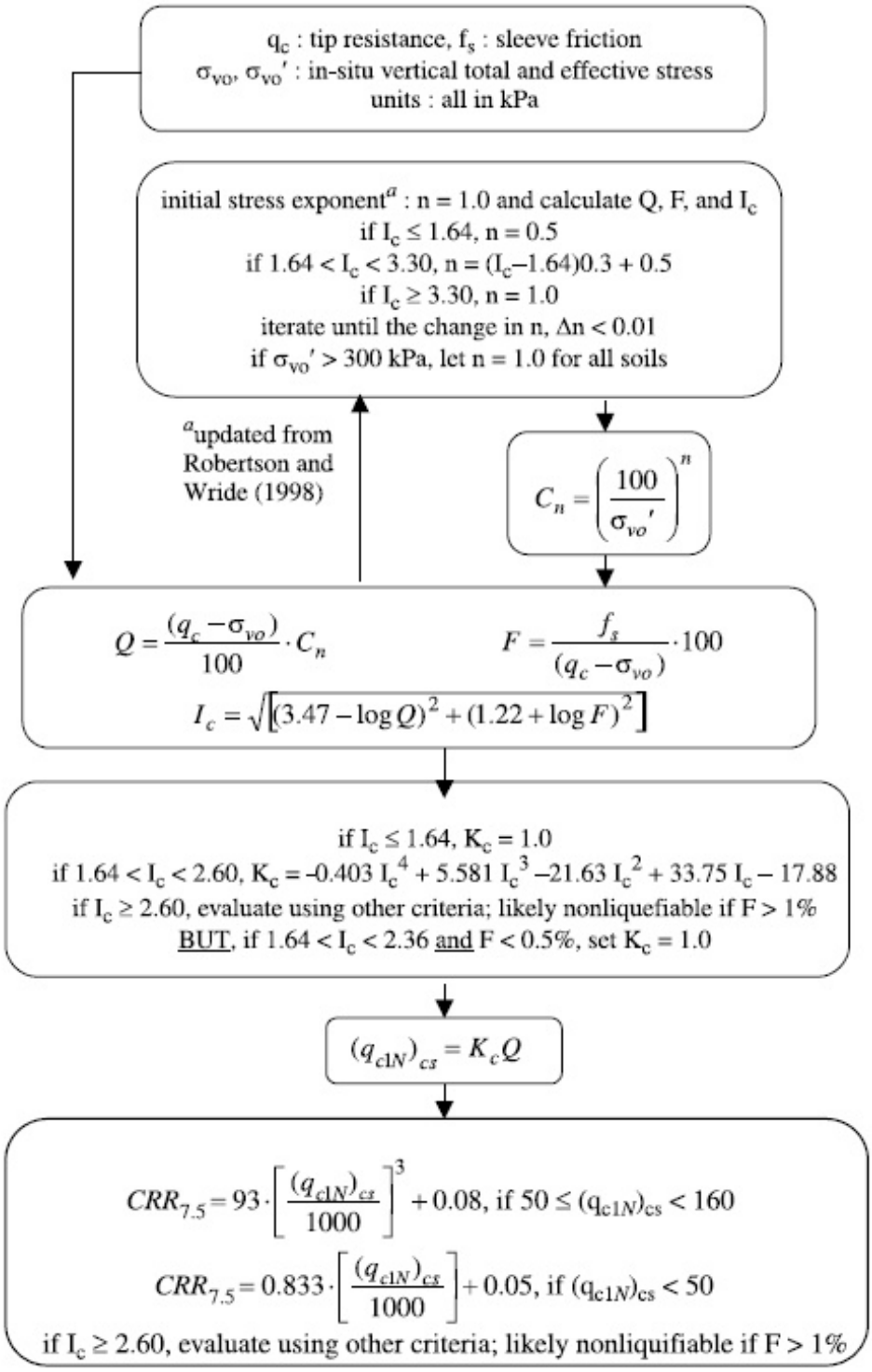
Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
39.53	23.57	16.98	4.74	80.50	2.79	1.20	1.20
39.70	22.98	16.40	5.11	83.87	2.84	1.16	1.16
39.86	22.11	15.63	5.34	83.53	2.86	1.11	1.11
40.03	21.73	15.27	5.38	82.20	2.87	1.08	1.08
40.19	21.66	15.17	5.35	81.19	2.86	1.07	1.07
40.35	21.50	14.99	5.35	80.23	2.86	1.06	1.06
40.52	20.82	14.41	5.38	77.48	2.87	1.02	1.02
40.68	20.07	13.77	5.39	74.29	2.87	0.98	0.98
40.85	20.25	13.88	5.24	72.70	2.85	0.98	0.98
41.01	21.65	14.95	4.94	73.90	2.82	1.05	1.05
41.18	24.58	17.16	4.95	84.86	2.82	1.21	1.21
41.34	35.44	25.82	3.52	90.94	2.63	1.79	1.79
41.50	46.68	34.90	2.70	94.10	2.49	0.69	0.69
41.67	47.56	35.66	2.44	87.02	2.43	0.69	0.69
41.83	36.90	26.93	2.95	79.47	2.53	0.66	0.66
42.00	24.51	16.93	4.24	71.84	2.73	1.18	1.18
42.16	20.53	13.73	5.00	68.70	2.83	0.27	0.97
42.32	19.20	12.63	5.37	67.87	2.87	0.30	0.89
42.49	18.42	11.98	5.67	67.93	2.90	0.29	0.85
42.65	18.41	11.93	5.65	67.44	2.90	0.27	0.85
42.82	18.89	12.25	5.53	67.82	2.88	0.28	0.87
42.98	19.53	12.70	5.40	68.64	2.87	0.30	0.90
43.14	19.84	12.90	5.32	68.60	2.86	0.30	0.91
43.31	20.18	13.15	5.07	66.75	2.83	0.28	0.93
43.47	20.26	13.18	4.99	65.83	2.82	0.24	0.93
43.64	21.37	13.95	4.96	69.27	2.82	0.27	0.98
43.80	23.93	15.74	5.25	82.56	2.85	1.11	1.11
43.96	30.42	20.53	4.79	98.41	2.80	1.44	1.44
44.13	38.85	26.85	4.13	110.94	2.72	1.87	1.87
44.29	42.52	29.56	3.90	115.38	2.69	2.05	2.05
44.46	41.23	28.51	3.90	111.12	2.69	1.98	1.98
44.62	35.35	23.96	4.31	103.25	2.74	1.67	1.67
44.78	32.33	21.63	4.49	97.09	2.76	1.51	1.51
44.95	32.26	21.55	4.36	93.90	2.75	1.50	1.50
45.11	31.78	21.16	4.27	90.42	2.74	1.47	1.47
45.28	28.30	18.54	4.44	82.37	2.76	1.29	1.29
45.44	23.10	14.62	5.14	75.14	2.84	1.03	1.03
45.60	20.58	12.70	5.66	71.88	2.90	0.90	0.90
45.77	21.95	13.68	5.36	73.33	2.86	0.96	0.96
45.93	23.88	15.12	4.68	70.74	2.79	1.06	1.06
46.10	27.95	18.26	3.61	65.99	2.64	0.23	1.25
46.26	31.19	20.84	2.89	60.28	2.52	0.09	0.63

Abbreviations

q_t:	Total cone resistance
K_c:	Cone resistance correction factor due to fines
$Q_{tn,cs}$:	Adjusted and corrected cone resistance due to fines
I_c:	Soil behavior type index
$S_{u(liq)}/\sigma'_v$:	Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$:	Calculated peak undrained strength ratio

Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

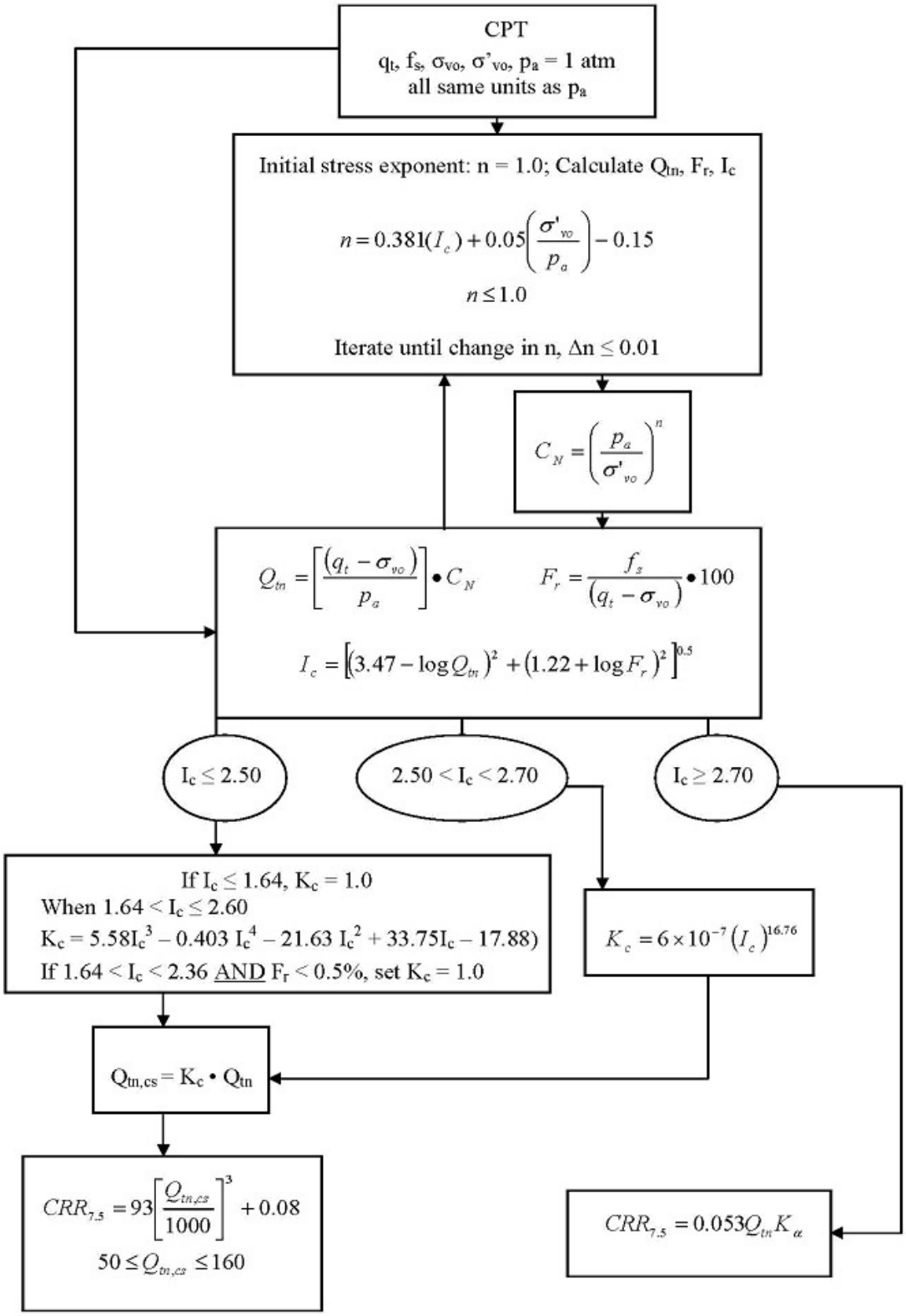
Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

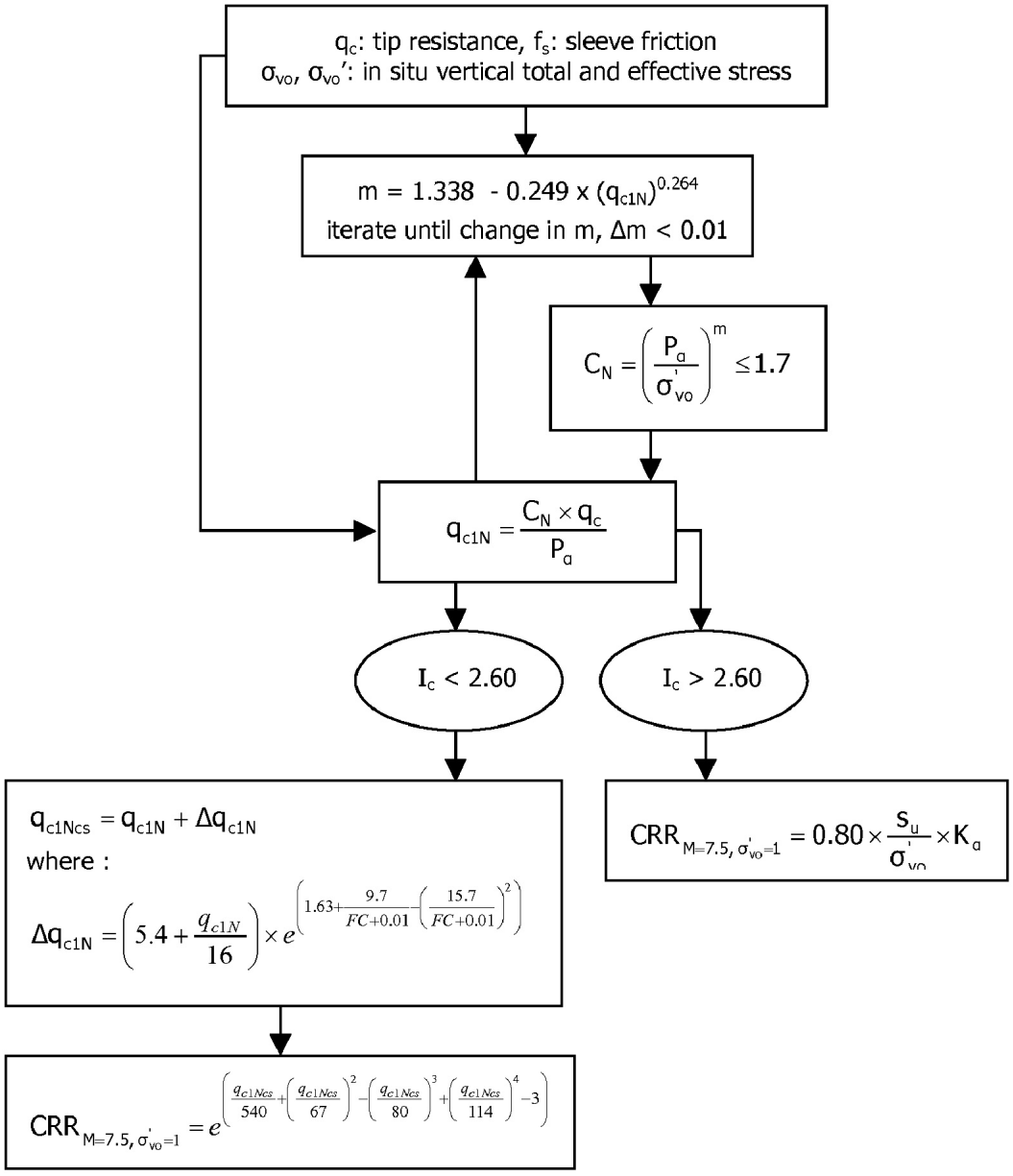
Procedure for the evaluation of soil liquefaction resistance (all soils), Robertson (2010)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. This procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:

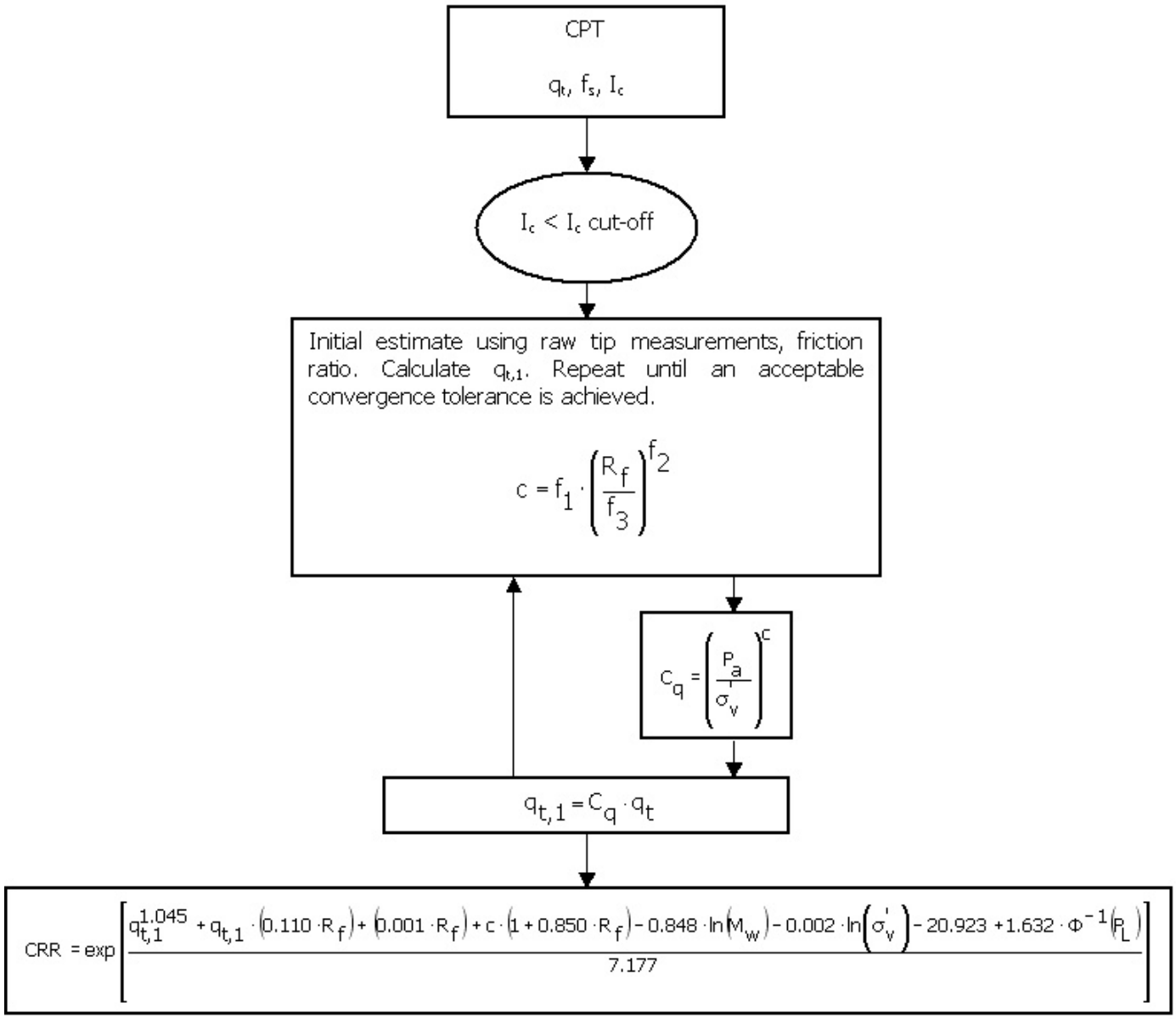


[1] P.K. Robertson, 2009. "Performance based earthquake design using the CPT", Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering – from case history to practice, IS-Tokyo, June 2009

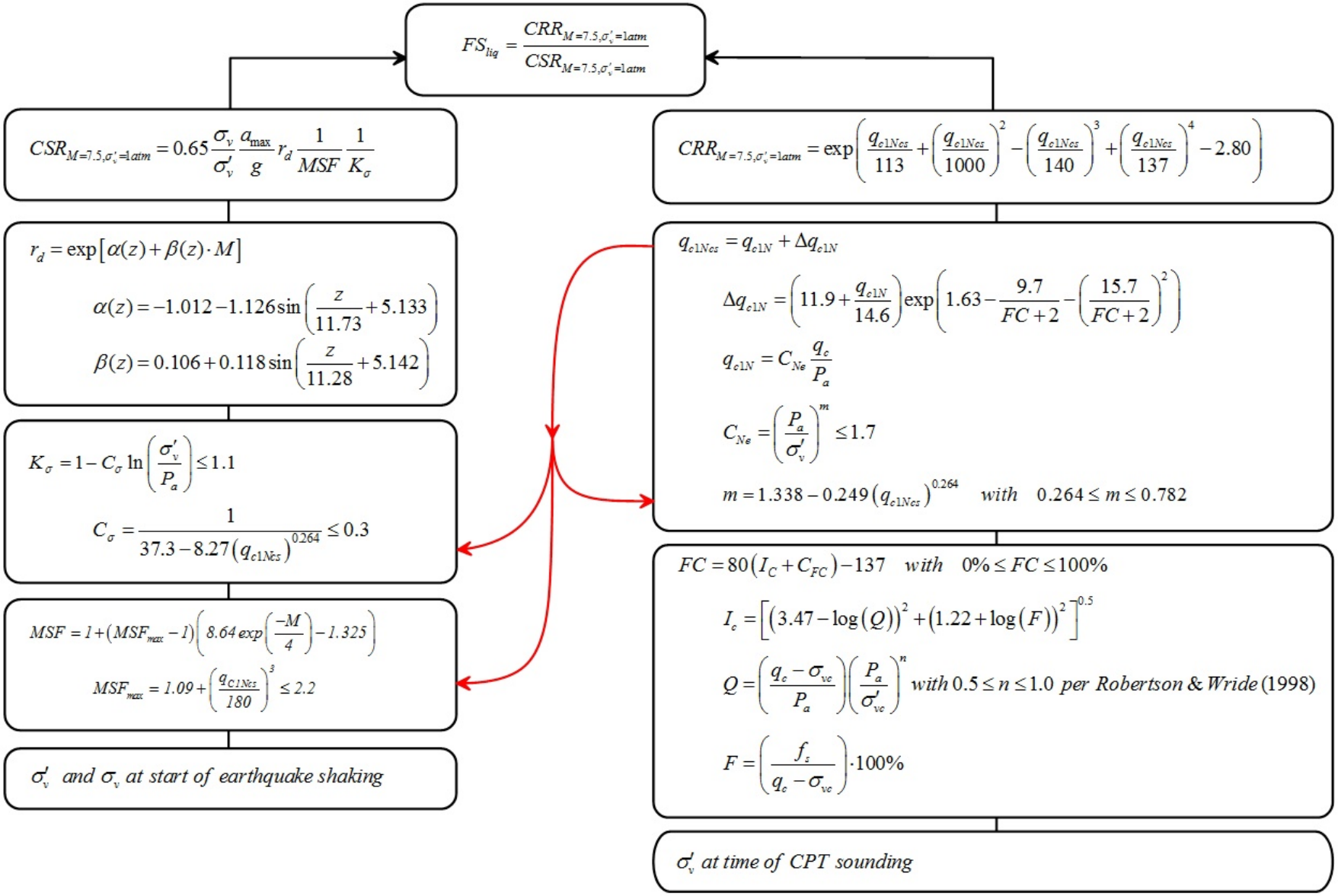
Procedure for the evaluation of soil liquefaction resistance, Idriss & Boulanger (2008)



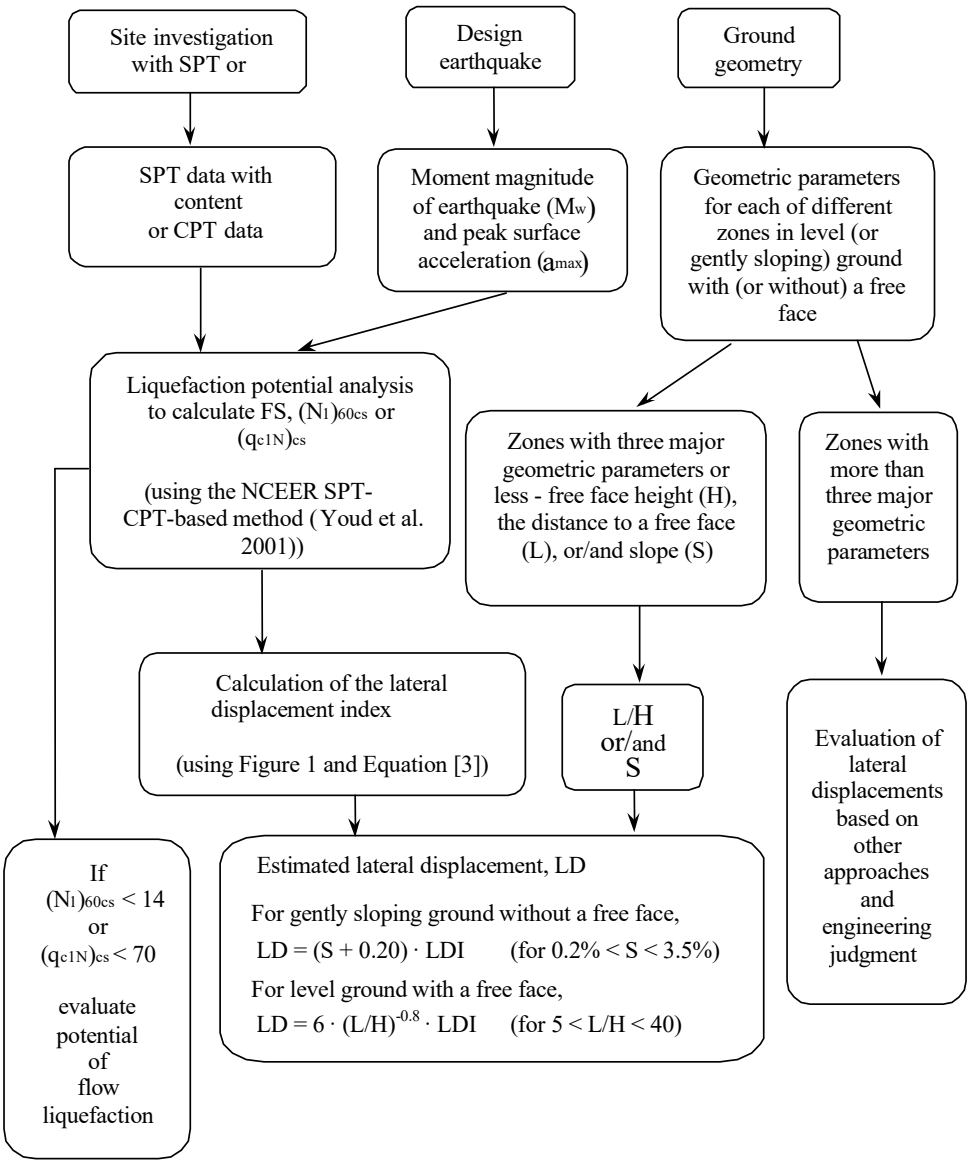
Procedure for the evaluation of soil liquefaction resistance (sandy soils), Moss et al. (2006)



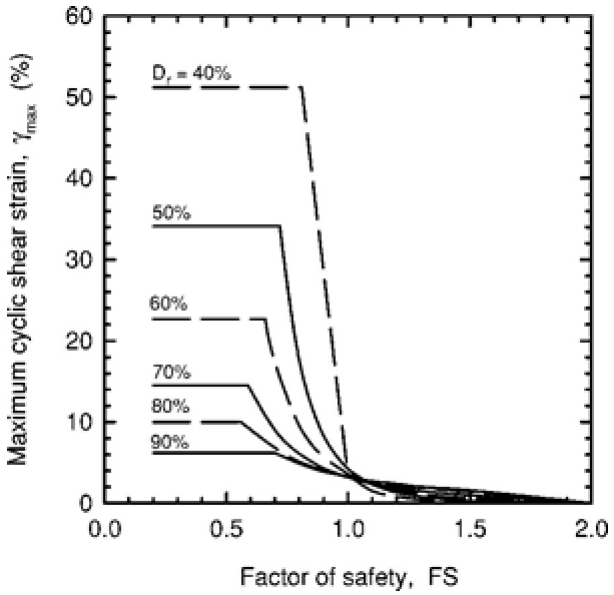
Procedure for the evaluation of soil liquefaction resistance, Boulanger & Idriss(2014)



Procedure for the evaluation of liquefaction-induced lateral spreading displacements



[1] Flow chart illustrating major steps in estimating liquefaction-induced lateral spreading displacements using the proposed approach



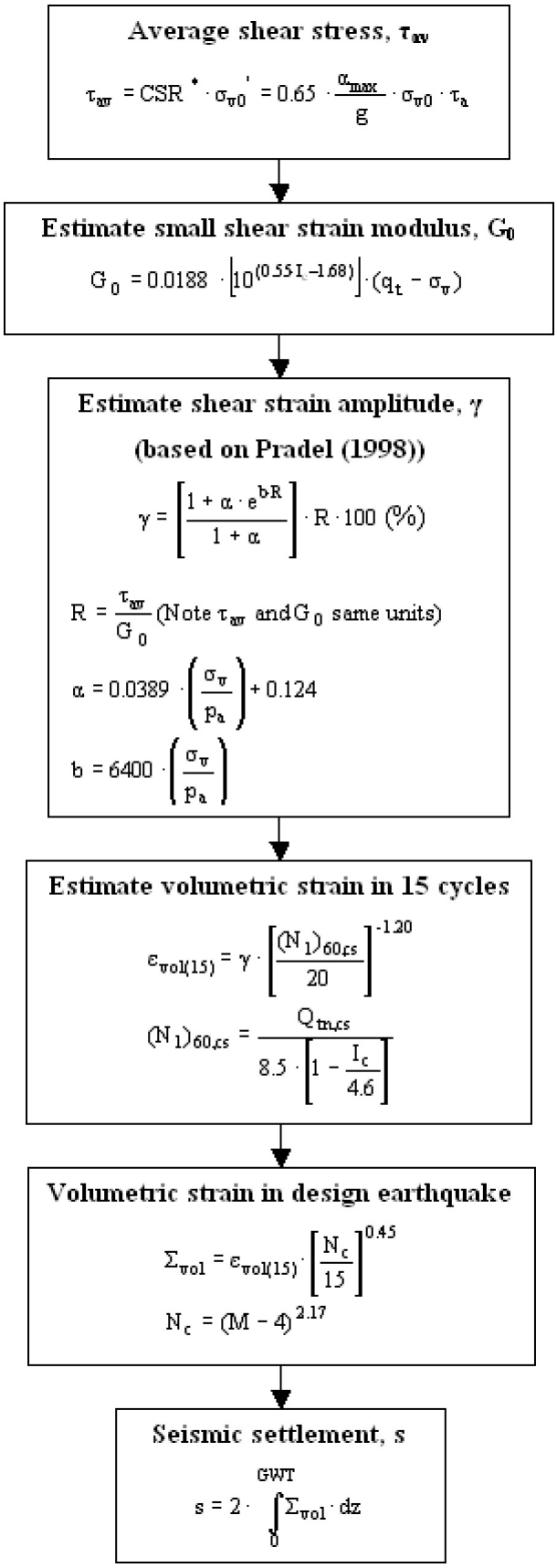
[1] **Figure 1**

$$LDI = \int_0^{z_{max}} \gamma_{max} dz$$

[1] **Equation [3]**

[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands



Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

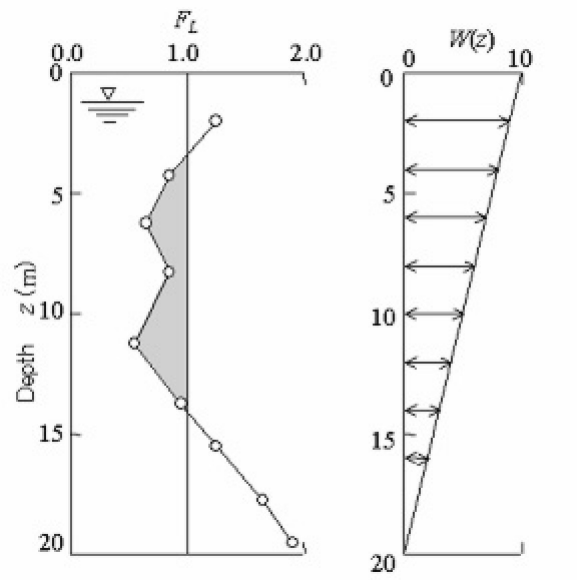
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\mathbf{LPI} = \int_0^{20} (10 - 0{,}5z) \times F_L \times dz$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

Shear-Induced Building Settlement (Ds) calculation procedure

The shear-induced building settlement (Ds) due to liquefaction below the building can be estimated using the relationship developed by Bray and Macedo (2017):

$$Ln(Ds) = c1 + c2 * LBS + 0.58 * Ln\left(Tanh\left(\frac{HL}{6}\right)\right) + 4.59 * Ln(Q) - 0.42 * Ln(Q)^2 - 0.02 * B + 0.84 * Ln(CAVdp) + 0.41 * Ln(Sa1) + \varepsilon$$

where Ds is in the units of mm, c1= -8.35 and c2= 0.072 for LBS ≤ 16, and c1= -7.48 and c2= 0.014 otherwise. Q is the building contact pressure in units of kPa, HL is the cumulative thickness of the liquefiable layers in the units of m, B is the building width in the units of m, CAVdp is a standardized version of the cumulative absolute velocity in the units of g-s, Sa1 is 5%-damped pseudo-acceleration response spectral value at a period of 1 s in the units of g, and ε is a normal random variable with zero mean and 0.50 standard deviation in Ln units. The liquefaction-induced building settlement index (LBS) is:

$$LBS = \sum W * \frac{\varepsilon_{shear}}{z} dz$$

where z (m) is the depth measured from the ground surface > 0, W is a foundation-weighting factor wherein W = 0.0 for z less than Df, which is the embedment depth of the foundation, and W = 1.0 otherwise. The shear strain parameter (ε_shear) is the liquefaction-induced free-field shear strain (in %) estimated using Zhang et al. (2004). It is calculated based on the estimated Dr of the liquefied soil layer and the calculated safety factor against liquefaction triggering (FSL).

References

- Lunne, T., Robertson, P.K., and Powell, J.J.M 1997. Cone penetration testing in geotechnical practice, E & FN Spon Routledge, 352 p, ISBN 0-7514-0393-8.
- Boulanger, R.W. and Idriss, I. M., 2007. Evaluation of Cyclic Softening in Silts and Clays. ASCE Journal of Geotechnical and Geoenvironmental Engineering June, Vol. 133, No. 6 pp 641-652
- Boulanger, R.W. and Idriss, I. M., 2014. CPT AND SPT BASED LIQUEFACTION TRIGGERING PROCEDURES. DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING COLLEGE OF ENGINEERING UNIVERSITY OF CALIFORNIA AT DAVIS
- Robertson, P.K. and Cabal, K.L., 2007, Guide to Cone Penetration Testing for Geotechnical Engineering. Available at no cost at http://www.geologismiki.gr/
- Robertson, P.K. 1990. Soil classification using the cone penetration test. Canadian Geotechnical Journal, 27 (1), 151-8.
- Robertson, P.K. and Wride, C.E., 1998. Cyclic Liquefaction and its Evaluation based on the CPT Canadian Geotechnical Journal, 1998, Vol. 35, August.
- Youd, T.L., Idriss, I.M., Andrus, R.D., Arango, I., Castro, G., Christian, J.T., Dobry, R., Finn, W.D.L., Harder, L.F., Hynes, M.E., Ishihara, K., Koester, J., Liao, S., Marcuson III, W.F., Martin, G.R., Mitchell, J.K., Moriwaki, Y., Power, M.S., Robertson, P.K., Seed, R., and Stokoe, K.H., Liquefaction Resistance of Soils: Summary Report from the 1996 NCEER and 1998 NCEER/NSF Workshop on Evaluation of Liquefaction Resistance of Soils, ASCE, Journal of Geotechnical & Geoenvironmental Engineering, Vol. 127, October, pp 817-833
- Zhang, G., Robertson. P.K., Brachman, R., 2002, Estimating Liquefaction Induced Ground Settlements from the CPT, Canadian Geotechnical Journal, 39: pp 1168-1180
- Zhang, G., Robertson. P.K., Brachman, R., 2004, Estimating Liquefaction Induced Lateral Displacements using the SPT and CPT, ASCE, Journal of Geotechnical & Geoenvironmental Engineering, Vol. 130, No. 8, 861-871
- Pradel, D., 1998, Procedure to Evaluate Earthquake-Induced Settlements in Dry Sandy Soils, ASCE, Journal of Geotechnical & Geoenvironmental Engineering, Vol. 124, No. 4, 364-368
- Iwasaki, T., 1986, Soil liquefaction studies in Japan: state-of-the-art, Soil Dynamics and Earthquake Engineering, Vol. 5, No. 1, 2-70
- Papathanassiou G., 2008, LPI-based approach for calibrating the severity of liquefaction-induced failures and for assessing the probability of liquefaction surface evidence, Eng. Geol. 96:94–104
- P.K. Robertson, 2009, Interpretation of Cone Penetration Tests - a unified approach., Canadian Geotechnical Journal, Vol. 46, No. 11, pp 1337-1355
- P.K. Robertson, 2009. "Performance based earthquake design using the CPT", Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering - from case history to practice, IS-Tokyo, June 2009
- Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, *Symposium in honor of professor I. M. Idriss,* SAN diego, CA
- R. E. S. Moss, R. B. Seed, R. E. Kayen, J. P. Stewart, A. Der Kiureghian, K. O. Cetin, CPT-Based Probabilistic and Deterministic Assessment of In Situ Seismic Soil Liquefaction Potential, Journal of Geotechnical and Geoenvironmental Engineering, Vol. 132, No. 8, August 1, 2006
- I. M. Idriss and R. W. Boulanger, 2008. Soil liquefaction during earthquakes, Earthquake Engineering Research Institute MNO-12
- Jonathan D. Bray & Jorge Macedo, Department of Civil & Environmental Engineering, Univ. of California, Berkeley, CA, USA, Simplified procedure for estimating liquefaction -induced building settlement, *Proceedings of the 19th International Conference on Soil Mechanics and Geotechnical Engineering, Seoul 201*

APPENDIX E

Geotechnical Terms/Definitions

Referenced Geotechnical Terms

ASTM: **A**merican **S**ociety for **T**esting and **M**aterials is one of the largest voluntary standards development systems in the world. Soils and materials tests are described in detail in their annual books of standards.

Bench: A relatively level step, excavated into acceptable material of a slope face, against which fill is to be placed. Its purpose is to provide a firm and stable contact between the existing material and the new fill to be placed.

Buttress: An engineered fill designed and built to support or retain a weak or unstable Slope.

Compaction: The densification of soil through mechanical manipulation (tamping, rolling, vibrating, etc.). The addition of optimum amounts of water can be crucial to obtaining adequate densification of the material.

Cut: The depth to which a material is to be removed/excavated to reach final grade elevation.

Consolidation: The gradual reduction in volume of a soil mass due to an increase in compressive stress (load).

Daylight Line: The surface contact of *cut* and *fill* soil.

Density Test: A field test used to determine compaction of a fill or native soil. The test is typically performed by the nuclear gauge method.

Expansive Soil: A soil (usually clayey) that increases in volume when water is added (expands), and shrinks when water content is reduced.

Geotechnical: Pertaining to the practical applications of soil science and civil Engineering.

Geotextile Fabric: A permeable fabric used during grading to stabilize, allow for drainage, filtration, or add reinforcement beneath a pavement or structure.

Maximum Density Test: ("curve", "max"," or "proctor") A laboratory test used to determine the optimum moisture and maximum dry density of a soil type (typically ASTM standard test method D 1557).

Native Soil (Natural Ground, NG): (1) Soil deposited by the forces of nature through weathering, erosion, etc.; soil that has not been moved by man. (2) The undisturbed surface prior to the commencement of grading, sometimes referred to as Original Ground (OG).

Nesting: Oversized material (typically >6" size) that has been placed in a manner that leaves voids between the piled boulder or rock fragments, and these voids are not infilled with solid material (soil, fine gravel/sand, etc). The <u>absence</u> of nesting rock is required in a *rock fill*.

NICET: National **I**nstitute for **C**ertification in **E**ngineering **T**echnologies. Engineering technicians that are tested by NICET may be certified at various levels of expertise (Levels I through IV) in different fields of construction.

Optimum Moisture: The moisture content at which the maximum density of a soil can be achieved during the compaction process. Each soil type (or blend of soil types) has its own specific optimum moisture content that is used as a guide for moisture conditioning during the grading process.

Over-excavation: The removal of the upper portion of soil on site. Usually performed under roadways or building pads and combined with replacement of structural fill

Pass: One trip or movement across a designated area by a piece of compaction equipment or machinery.

Percent Compaction: The ratio (expressed as a percentage) of the dry density of a soil (as determined by the nuclear gauge) to the maximum density of a soil (as determined by the maximum density test).

Pre-Saturation: The moisture conditioning (above optimum) of a pad subgrade or footing excavation prior to placing/pouring a foundation. Pre-saturation is usually performed on expansive soils to help limit future swelling that may be caused by seasonal rains or heavy landscape watering.

Pumping: May be observed as a rolling motion in soils compacted in an over-optimum condition (too wet). These pumping soils may, during the rolling process, become rutted or indented by rubber-tired equipment, usually leaving a bulging path in the soil parallel to the tire print.

Relative Compaction: A means of comparing the dry soil density in the field to the laboratory compaction curve. It equals the field dry density divided by the lab max dry density, and then is multiplied by 100 and expressed as a percentage.

Rock Fill: "Oversized material" (typically 6" or larger diameter) mixed/compacted during placement with a soil matrix in such a manner as to limit voids and nesting, allowing for a homogeneous, well-compacted fill.

Scarify (Rip): The act of loosening the exposed surface material (usually the upper 8-12 inches by ripper teeth on a dozer or blade) to mix, blend, moisten, or prepare for fill placement.

Structural Fill: Fill that is supporting manmade structures, including buildings, roadways, levees, and slopes. Structural Fill is typically compacted to 90 percent relative compaction.

Subdrain: A drainage system placed beneath the surface to drain surface water, or relieve hydrostatic pressure (such as water buildup behind a fill slope). It typically consists of filter material (rock and/or fabric) and a perforated drainpipe.

Toe: The contact point of the bottom of a fill or cut slope with a relatively level or pre-existing ground surface.

Transition Lot: A lot which a portion is to be cut (excavated) and a portion is to be filled (raised) to reach pad grade.

Unified Soil Classification System (USCS): A system used by soil engineers to classify soil for engineering purposes. A kind of a shorthand for describing soil types.

Kenneth L. Finger, Ph.D.
Consulting Paleontologist

18208 Judy St., Castro Valley, CA 94546-2306 510.305.1080 klfpaleo@comcast.net

July 13, 2021

Dana DePietro
FirstCarbon Solutions
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597

Re: Paleontological Records Search for the 731 W. Cutting Boulevard Project (2121.0022), Richmond, Contra Costa County

Dear Dr. DePietro:

As per the request of Regan Del Rosario, I have performed a paleontological records search for the 731 W. Cutting Boulevard project in Richmond. The 7.94-acre site is bounded by Canal Boulevard on the west, West Cutting Boulevard to the south, industrial sites on the east, and Interstate 580 (I-580) to the north. Its PRS location is SW¼, SW¼, Sec. 13, T1N, R5W, San Quentin quadrangle (USGS 7.5-series topographic map), where it is bordered to the east by the Richmond quadrangle. Google Earth imagery shows nearly the entirety of this flat terrain is covered by an asphalted parking lot; hence, it is heavily disturbed.

Geologic Units

According to the part of the geologic maps of Blake et al. (2000) and Dibblee and Minch (2005) shown here, the surface of the entire project site (yellow rectangle at center) is artificial fill over marine and marsh deposits (Qmf), while its half-mile search area (dashed outline) also has Holocene alluvium (Qa) and Cretaceous sandstone and shale of the Franciscan Complex (Kfs).



UCMP Records Search

Artificial fill is historical Holocene, which is too young to be fossiliferous, so the database search focused on the alluvium and Franciscan rocks. Neither Blake et al. (2000) nor Dibblee and Minch (2005) differentiate the Quater-

nary alluvium as Pleistocene or Holocene. Between the San Quentin or Richmond quadrangles, there are six Quaternary localities, all of which are recorded as Recent (Holocene), which strongly suggests that the surficial alluvium on the project site is of that age. The only significant fossils known from Franciscan rocks are plants from two localities in San Luis Obispo and Monterey Counties, and vertebrates from two localities in San Joaquin and San Luis Obispo Counties. The latter are represented by two notable specimens: the types of the Late Jurassic marine reptiles *Icthyosaurus franciscanus* and *Plesiosaurus hesternus* (see Hilton, 2003).

Remarks and Recommendations

It is apparent that significant paleontologic resources are extremely unlikely to be encountered during earth-disturbing contstruction activities on this project site. I therefore do not recommend any further paleontological mitigation for this project.

Sincerely,



References Cited

Blake, M.C., Graymer, R.W., Jones, D.L., and Soule, A., 2000, Geologic map and map database of parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties, California. U.S. Geological Survey Miscellaneous Field Studies Map MF-2337, scale 1:75,000.

Dibblee, T.W., and Minch, J.A., 2005, Geologic map of the Richmond quadrangle, Contra Costa & Alameda Counties, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-147, scale 1:24,000.

Hilton, R.P., 2003, Dinosaurs and other Mesozoic reptiles of California. University of California Press, Berkeley, 356 p.